

ZOOLOGICAL MONOGRAPH No. 1

JOSEPH  
NARENDRA & JOY

# ORIENTAL BRACHYMERIA

(HYMENOPTERA : CHALCIDIDAE)

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DEPARTMENT OF ZOOLOGY, UNIVERSITY OF CALICUT  
CALICUT UNIVERSITY P. O., INDIA

ORIENTAL BRACHYMERIA 1973

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THE RESEARCH GROUP WITH THE SPONSORING SCIENTIST



Left to Right: Mr. P. J. Joy, Dr. B. D. Burks (*Sponsoring Scientist*)  
Dr. K. J. Joseph and Mr. T. C. Narendran.

## PREFACE

This Monograph comprises the results of our investigations on the taxonomy of the Oriental species of *Brachymeria* (Hymenoptera: Chalcididae). It contains descriptions of 21 new species, 7 new subspecies, revisions of 43 known species including redescrptions of 16 little known species. Also included is a key to the Oriental species of *Brachymeria* known up to the present including the new forms described by us. Although very important contributions to our knowledge of the genus *Brachymeria* have been made by Rushcka (1920, 1922), Masi (1929), Burks (1936, 1960), Boucek (1951, 1956), Nikol'skaya (1952), Steffan (1954, 1959) and Habu (1960, 1962), it is for the first time that a monograph on the species of *Brachymeria* of an entire Zoogeographical realm, viz., the Oriental Region, is prepared.

This work was made possible by a grant under P. L. 480 for a project on the taxonomic studies of the Oriental Species of *Brachymeria*, financed by the Agricultural Research Service, United States Department of Agriculture, Washington D. C. (U. S. A.), in collaboration with the Indian Council of Agricultural Research, Government of India. The work was carried out for one year under the University of Kerala and later for four years under the University of Calicut. Our sincere thanks are due to the authorities concerned for enabling us to complete the work.

The very valuable suggestions and help given by our Sponsoring Scientist, Dr. B. D. Burks, Entomologist, Insect Identification and Parasite Introduction Research Branch, U. S. Department of Agriculture, Washington, at all stages of the work, is gratefully acknowledged. We record here our grateful thanks to the authorities of Bernice P. Bishop Museum (Honolulu), Magyar Nemzeti Museum (Budapest), Rijksmuseum van Natuurlijke Historie (Leiden), Museum National d'Histoire Naturelle (Paris), British Museum (Natural History, London), Commonwealth Institute of Biological Control (Bangalore), University of Agricultural Sciences (Bangalore), Agricultural College (Madurai), Zoological Survey of India (Calcutta) and Central Plantation Crops Research Institute (Kayamkulam), for sending us *Brachymeria* collections for study. We are also thankful to the authorities of Forest Research Institute (Dehra Dun), Indian Agricultural Research Institute (New Delhi) and Tamilnadu Agricultural University (Coimbatore), for allowing us to study their *Brachymeria* collections. Short taxonomic notes on various little known species and identified specimens were sent to us by Dr. Z. Boucek (Commonwealth Institute

of Entomology, C/o British Museum (Natural History), London), Dr. Akinobu Habu (Division of Entomology, National Institute of Agricultural Sciences, Japan), Dr. J. R. Steffan (Museum National D'Histoire Naturelle, Paris), Dr. V. A. Trjapitzin (Zoological Institute, Academy of Sciences, Leningrad, U. S. S. R. ) and Dr. Wayne C. Gagne (Bishop Museum, Honolulu). But for this help it would not have been possible to redescribe a number of little known species and to study the synonymies involved. We shall be failing in our duty if we do not thank these specialists for all their help and cooperation.

We take this opportunity again to record our deep sense of gratitude to Dr. Akinobu Habu, Division of Entomology, National Institute of Agricultural Sciences, Japan, and the Editors of The Bulletin of the National Institute of Agricultural Sciences, Kontyu, and Mushi, of Japan for allowing us the free use of their publications, citations, etc., and for permitting us to copy 16 sets of figures of as many species of *Brachymeria*. We are also thankful to Dr. Chhotani, Zoological Survey of India, Calcutta, and The Zoological Society of India for allowing us to copy the description and figures of *B. burksi*.

It is hoped that this work will facilitate identifications of most of the Oriental species of *Brachymeria* and also stimulate further research on this economically important group of insects which are abundant in the tropics and play an important role in the natural control of many pest species.

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## ERRATA

Page 15, line 5 from top, for Preorbital carina present, read *Preorbital carina usually well represented* ..... 71

Page 15, line 6 from top, for Preorbital carina absent, read *Preorbital carina usually not well represented* ..... 70

Page 15, line 7 from top, for Postorbital carina absent, read *Postorbital carina present*.

Page 65, line 18 from top, *Distribution*: for India and N. Guinea read *Pakistan and N. Guinea*.

Page 152, line 25 from top, for establish clear-out differences between the two species, read establish *clear-cut* differences between the two species.

Page 160, line 26 from top, insert = in front of *punctulata* Forst.

In the key *B. funesta* Habu, *B. hattoriae* Habu and *B. aganoxenae* Fullaway should also be considered as species not reported but are likely to be present in the Oriental Region. The asterisk as mentioned as foot-note on p. 14 is applicable to these species also.

## INTRODUCTION

The Parasitic Hymenoptera, particularly the Chalcidoidea, are the most important group of entomophagous insects utilized in the biological control of insect pests. Studies on the taxonomy, biology and other aspects of entomophagous insects can supply the basic information necessary for undertaking biological control and for its efficient operation. However such basic and fundamental information is not available on the Chalcidoid fauna of many parts of the World, particularly of the developing and underdeveloped countries where the losses suffered due to damage to crops by insect pests are often enormous. The object of the present Monograph on the Oriental species of *Brachymeria* Westwood has therefore been to bring together information on the species of the genus *Brachymeria* from the Oriental region, their synonymies, distribution, host specificity and to give a key to their identification.

The genus *Brachymeria* includes the most common and widely distributed species in the family Chalcididae. Many species of this genus are primary parasites in Orthoptera (Acrididae), Lepidoptera (many families), Homoptera (few families), Diptera (Sarcophagidae and related families) and Coleoptera. In the hyperparasitic role some species are found to parasitise Diptera (Tachinidae) and Ichneumonid Hymenoptera. Though all the species of *Brachymeria* look very much alike, they differ widely in habits. Therefore the precise determination of the species concerned is highly important in any host-parasite study for biological control involving this genus. For example, our studies have shown that for the Control of *Nephantis serinopa* M., the Black-Headed Caterpillar pest of Coconut in Kerala, six species of *Brachymeria*, viz., *B. lasus* Walker, *B. excarinata* Gahan, *B. (Neobrachymeria) nosatoi* Habu, *B. euploae* Westwood, *B. hime attevae* Joseph *et al* and *B. nephantidis* Gahan are involved. Unfortunately in earlier biological control programmes of this pest, it was thought that only one species of *Brachymeria* viz., *B. nephantidis* was involved. This new information based on careful taxonomic studies should be of great value in future control programmes against the Black-Headed Caterpillar pest of Coconut in Kerala and elsewhere. It is hoped that this Monograph will stimulate interest in the further study of the taxonomy, biology, host-parasite relations, etc. of the species of the genus *Brachymeria* so that these parasites are utilised more and more in biological control programmes of insect pests.

STATUS OF TAXONOMIC CHARACTERS,  
TERMINOLOGY AND METHODS

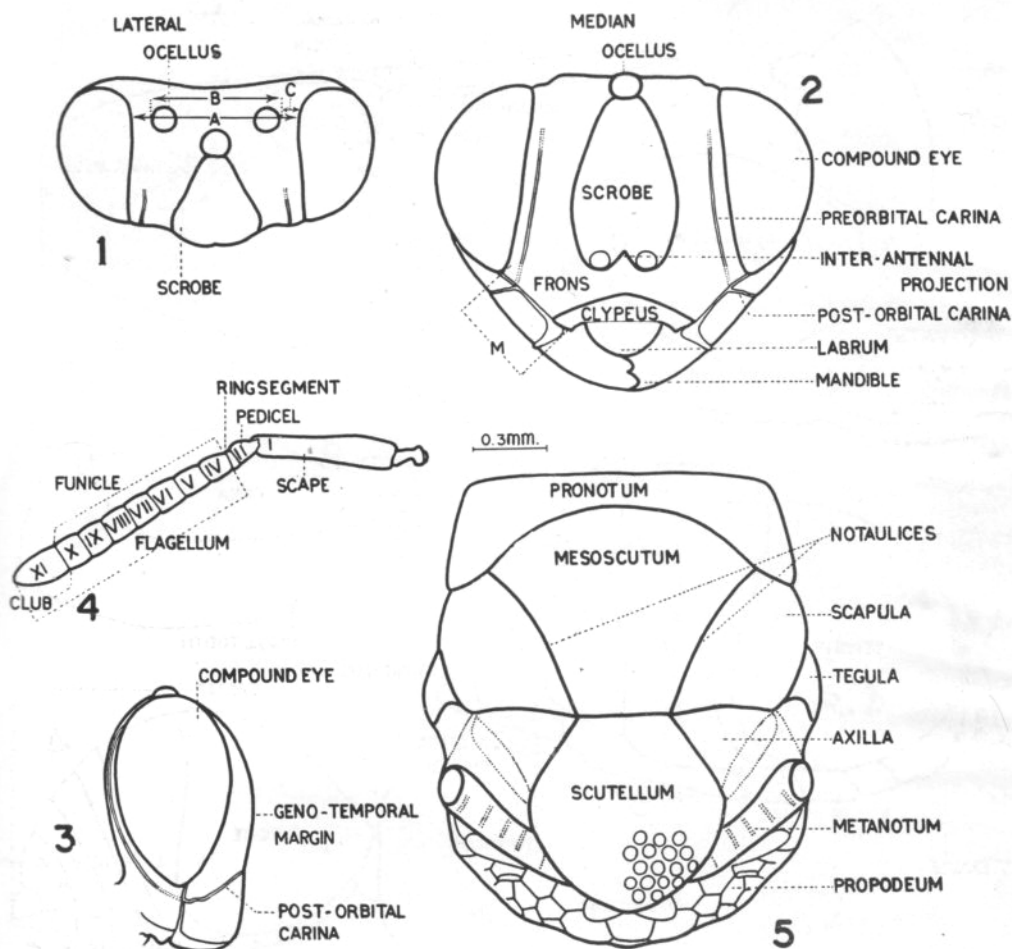
The characters which we found important for the taxonomic study of the species of *Brachymeria* are: 1. On the head, the nature of the preorbital and postorbital carinae, scrobe reaching the front ocellus or not, lateral ridges of scrobe produced in front of the antennal toruli or not, area below scrobe with or without a median raised smooth portion or not, and length of the scape of the antenna; 2. on the thorax, the nature of the punctures on the meso-scutum and scutellum, apex of scutellum emarginate or not, colour of the hind femur and tibia, presence or absence of a tooth on the inner ventral side of the hind coxa, and presence or absence of an inner basal tooth on the hind femur; 3. on the abdomen, nature of the punctures on the first, second and sixth tergites and shape of the abdomen.

Some of the other characters like the proportions of the interocular space, interocellar distance, ocellocular distance, length and width of the clypeus and labrum, smoothness or roughness of scrobe, measurements of the funicular segments of the antennae, proportions of the thorax, nature of the surface of propleura, mesopleura and metapleura, proportions of the fore wing and its veins, number of teeth on the outer ventral margin of hind femur, the general colouration of the fore and mid legs, nature of punctures on the third, fourth and fifth tergites and length and width of the abdomen, have not been found to be very reliable characters for specific identification. We have not been able to assess the importance of the structure of the genitalia in the determination of the different species involved.

*Head.* The frons, median ocellus, pre-orbital carina, scrobe, inter-antennal projection, clypeus, labrum, and dimensions of the head and width of the compound eye are studied and measured in the fronto-ventral direction (Pl. 1 : fig. 2). Vertex, lateral ocelli, width of ocellar area, interocellar distance, interocular space and ocellocular distance are studied and measured from the fronto-dorsal side of the head (Pl. 1 : fig. 1). Postorbital carina, the genal angles and the height of malar space are studied from the lateral view of the head (Pl. 1 : fig. 3). Height of compound eye is measured from the topmost part of the compound eye to its lowest part. The area from just below the front ocellus to above the clypeus is the frons.

The antennal measurements are taken after mounting them on a slide (Pl. 1 : fig. 4).

# PLATE 1

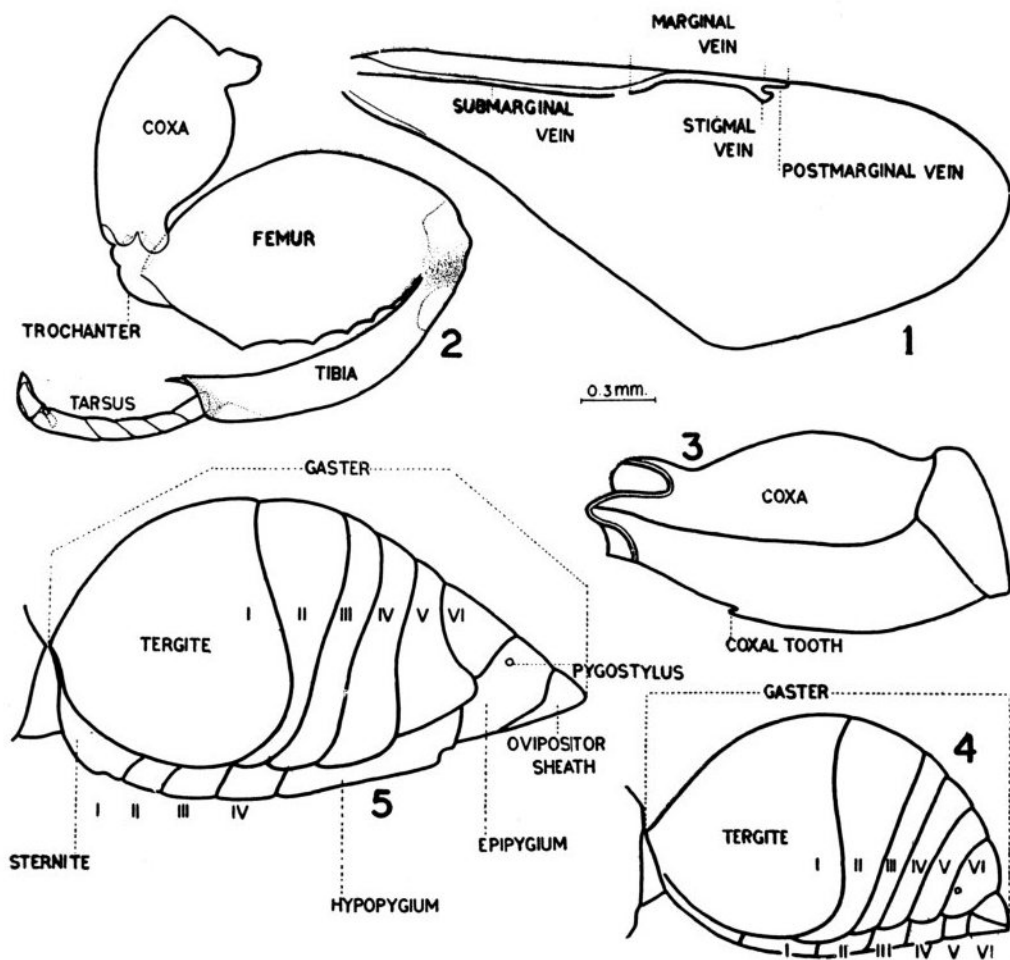


Figs. 1 - 5: *Brachymeria nephantidis* Gah. (♀)

1. Fronto-dorsal view of head: A, width of interocular space at level of hind ocelli; B, width of ocellar area; C, ocellular distance.
2. Fronto-ventral view of the head: M, height of malar space.
3. Lateral view of the head
4. Antenna.
5. Dorsal view of the thorax.



# PLATE 2



Figs. 1, 2, 4 & 5: *Brachymeria nephantidis* Gah., Fig. 3: *B. lasus* Walk.

1. Fore wing. (♀)
2. Hind leg. (♀)
3. Hind coxa of *B. lasus* Walk. (♀)
4. Abdomen of *B. nephantidis*. (♂)
5. Abdomen. (♀)

*Thorax.* Measurements of the thorax are taken from the dorsal side (Pl. 1 : fig. 5). The maximum width of the thorax is measured slightly before the tegulae. Punctures on the scutellum are said to be 'close' when interspaces between the punctures are less than half as broad as the punctures. Punctures are not close when interspaces are half as broad as the punctures or more than half as broad as the punctures.

The fore wing venation and their measurements are shown in Pl. 2 : fig. 1.

*Abdomen.* The tergites and sternites are numbered in Pl. 2: figs. 4 & 5. The length and height of abdomen are measured from the side.

#### LIST OF INSTITUTIONS WHICH LOANED BRACHYMERIA SPECIMENS FOR STUDY

HONOLULU	Bernice P. Bishop Museum, Honolulu, Hawaii, (U. S. A.).
LEIDEN	Rijksmuseum van Natuurlijke Historie, 2 Raamsteeg, Leiden, (The Netherlands).
BUDAPEST	Magyar Nemzeti Museum, Baross-Utca 13, Budapest VIII, (Hungary).
PARIS	Museum National D'Histoire Naturelle, Entomologie Generale Et Appliquee, 45 bis, Rue de Buffon, Paris (V <sup>e</sup> ), (France).
LONDON	British Museum (Natural History), Cromwell Road, London S. W. 7, (England).
BANGALORE	Commonwealth Institute of Biological Control, Indian Station, Bellary Road, Bangalore-6, (S. India).
BANGALORE	University of Agricultural Sciences, Entomology Division, Hebbal, Bangalore, (S. India).
KAYAMKULAM	Central Plantation Crops Research Institute, Ochira, P. O., Kayamkulam, Kerala, (S. India).
MADURAI	Agricultural College, Madurai, Madras State, (S. India).
CALCUTTA	Zoological Survey of India, 34, Chittaranjan Avenue, Calcutta-12, (India).

LIST OF INSTITUTIONS VISITED FOR THE  
STUDY OF BRACHYMERIA

NEW DELHI	Indian Agricultural Research Institute, Pusa, New Delhi-12, (India).
DEHRA DUN	Forest Research Institute and Colleges, P. O. New Forest, Dehra Dun. (India).
COIMBATORE	Tamilnadu Agricultural University, Coimbatore-3, Madras State, (India).

HISTORICAL RESUMÉ

Chalcid species were first described in 1758 by Linnaeus who placed them in the genus *Cynips*. In 1820 Dalman first isolated the family Pteromalini and Latreille in 1825 described new species, combining them in the tribe Chalcidites. Only in 1840 did Westwood create the family Chalcididae. Thomson (1875) retained the name Pteromalidae for the Chalcids. Howard (1886) reestablished the family Chalcididae creating twenty subfamilies, which he placed into the two divisions proposed by Thomson (Macrocentri and Microcentri). Ashmead in 1904 renamed the family Chalcididae as the Superfamily Chalcidoidea, adding the group Mymaridae to thirteen families reconstituted by him from the subfamilies. Schmiedeknecht in 1909 used Ashmead's work for his "Genera Insectorum" isolating two new subfamilies Leucospinae and Eupelminae and demoted the taxonomic categories of the Chalcidoidea to the rank of the family Chalcididae. In 1923 Gahan and Fagan reviewed the chalcid wasp type species. In 1925 Handlirsch classified chalcids raising the subfamilies to twenty-two, adding seven new ones. Mani 1938 classified the superfamily Chalcidoidea into fourteen families and the family Chalcididae into two subfamilies Leucospinae and Chalcidinae. The Chalcidinae comprised five tribes: Brachymerariae, Halticellariae, Chalcidariae (= Smicrariae), Chalcitellariae and Dirhinariae. In "Hymenoptera of America North of Mexico: Synoptic Catalog", Burks (1951) classified the family Chalcididae into four subfamilies: Haltichellinae, Brachymerinae, Dirhininae and Chalcidinae. Boucek (1951) adopted the same classification in his revision of the European species of the Family Chalcididae. Habu (1960) in his revision of Chalcididae of Japan, classified the family Chalcididae into five subfamilies: Brachymerinae, Haltichellinae, Dirhininae, Epitraninae and Chalcidinae.

The genus *Brachymeria* is assigned to the subfamily Brachymerinae which includes three other genera: *Trigonura*, *Phasgonophora* and *Acanthochalcis* (Burks 1951). Masi (1929) described a new subgenus *Neobrachymeria*. Habu (1960) described *Matsumurameria*, another subgenus. Burks (1960) added two more new subgenera, viz., *Gahanula* and *Pseudobrachymeria*. Thus the genus *Brachymeria* at present comprises the following five subgenera:

1. Subgenus: *Matsumurameria* Habu
2. Subgenus: *Brachymeria* Westwood
3. Subgenus: *Gahanula* Burks
4. Subgenus: *Pseudobrachymeria* Burks
5. Subgenus: *Neobrachymeria* Masi

#### GENUS BRACHYMERIA WESTWOOD

Genotype: *Chalcis minuta* Linnaeus (Designated by Westwood 1840).

- 1767: *Chalcis*, Linne, *Syst. Nat.*, (ed. 12), **1**, ii, p. 952.
- 1787: *Chalcis*, Fabricius, *Mant. Ins.*, **1**, p. 272.
- 1829: *Brachymeria*, Westwood in Stephens' *Nomencl. Brit. Ins.*, **1**: 36.
- 1829: *Brachymeria*, Stephens, *Syst. Cat. Brit. Ins.*, pt. **1**, p. 393.
- 1832: *Brachymeria*, Westwood, *Phil. Mag.*, Ser. 3, **1**: 127.
- 1834: *Chalcis*, Walker, *Ent. Mag.*, **2**: 27-28. (nec Fabricius)
- 1872: *Chalcis*, Cresson, *Trans. Amer. Ent. Soc.*, **4**: 59.
- 1884: *Chalcis*, Cameron, *Biol. Cent. Amer., Ins., Hym.*, **VI**, p. 99.
- 1885: *Chalcis*, Howard, *U. S. Dept. Agr. Bur. Ent., Bull.*, **5**, p. 5.
- 1886: *Chalcis*, Howard, *Ent. Amer.*, **1**: 215.
- 1887: *Chalcis*, Cresson, *Trans. Amer. Ent. Soc.*, Suppl. **67**: 234.
- 1898: *Chalcis*, Dalla Torre, *Cat. Hym.*, **5**: 385.
- 1904: *Chalcis*, Ashmead, *Mem. Carnegie Mus.*, **1**: 249, 250, 369.
- 1904: *Onchochalcis*, Cameron, *Entomologist*, **37**: 161.  
(Genotype: *Onchochalcis marginata*)

- 1909: *Chalcis*, Schmiedeknecht, *Gen. Ins.*, fasc. **97**, p. 19, 20, 25.
- 1910: *Chalcis*, Crawford, *U. S. Dept. Agr. Bur. Ent. Tech. Ser.* **19**, p. 13.
- 1911: *Tumidicoxa*, Girault, *Zool. Jahrb. Abt. f. System* **31**: 378. (Genotype: *Tumidicoxa nigra*) .
- 1911: *Ceyxia*, Girault, *ibid.*: 382 (Genotype: *Ceyxia tumipennis*)
- 1913: *Brachepitelia*, Girault, *Canad. Ent.* **45**: 106 (Genotype: *Brachepitelia rubripes*).
- 1913: *Pseudepitelia*, Girault, *ibid.*: 104 (Genotype: *Pseudepitelia rubrifemur*)
- 1913: *Tumidicoxella*, Girault, *Trans. Roy. Soc. South. Austral.* **37**: 74, (Genotype: *Tumidicoxella nigricoxa*).
- 1913: *Tumidicoxoides*, Girault, *Arch. Naturg. Jahrg.* **79** A (6): 67 (Genotype: *Tumidicoxoides kurandaeusis*)
- 1913: *Chalcis*, Crawford, *Bull. U. S. Dept. Agric. Bur. Ent.*, No. **19** (2) 30, 11.
- 1922: *Chalcis*, Waterston, *Ind. For. Rec.*, **IX**, p. 53.
- 1922: *Chalcis*, Ruschka, *Konowia*, **1**: 221.
- 1923: *Brachymeria*, Gahan and Fagan, *U. S. Natl. Mus., Bull.* No. 124, p. 24.
- 1923: *Brachymeria*, Waterston, *Bull. Ent. Res.*, **14**: 103.
- 1928: *Brachymeria*, Gahan, Grorby and Leonard, in Leonard *Cornell Univ. Agr. Expt. Sta. Mem.* 101, p. 976.
- 1929: *Brachymeria*, Masi, *Soc. Ent. Ital.*, **8**: 114.
- 1935: *Brachymeria*, Dowden *Jour. Agr. Res.*, **50**: 495.
- 1936: *Brachymeria*, Burks, *Trans. Ill. Acad. Sci.*, **29**: 251.
- 1938: *Brachymeria*, Brimely, *Ins. N. Car.*, p. 421.
- 1938: *Brachymeria*, Mani, *Cat. Ind. Ins. Pt.* **23**: 49–58.
- 1946: *Brachymeria*, Schmitz, *Expl. Parc. Nat. Albert, Mis Dewite*, fasc. **48**, p. 17.
- 1950: *Brachymeria*, Masi, *Eos, Extr. Vol.*, p. 27.
- 1951: *Brachymeria*, Peck, in Muesebeck *et al.*, *U. S. Dept. Agr. Monog.* **2**, p. 421.

- 1951 : *Brachymeria*, Boucek, *Acta Ent. Mus. Nat. Prag.* **27** (Supp): 17.
- 1952 : *Brachymeria*, Nikolskaya, *Akd., Nauk. U. S. S. R. Fauna U. S. S. R.* **44**, p. 86.
- 1955 : *Brachymeria*, Erdor, *Fauna of Hungary*, **12** (2): 11.
- 1960 : *Brachymeria*, Habu, *Bull. Nat. Inst. Agr. Sci. (Japan) Ser. C.* **11**: 142.
- 1960 : *Brachymeria*, Burks, *Trans. Amer. Ent. Soc.* **LXXXVI**, 225-273.
- 1962 : *Brachymeria*, Habu, *Fauna Japonica*. pp. 12-65.

*Head* (Pl. 1: figs. 1, 2, 3) oval in profile; compound eyes large; scrobe deep, margins carinate; frons relatively flat, not rounded anteriorly as in *Trigonura*; occiput without vertical carina; fronto-genal sutures (malar ridge) well carinate, often with preorbital and postorbital carinae. Antennae (Pl. 1: fig. 4) relatively short; antennal insertion at or dorsal to level of ventral margins of compound eyes; scape and pedicel short; ring segment thin.

*Thorax* (Pl. 1: fig. 5) with umbilicate punctures; apex of scutellum rounded or emarginate. Fore wing (Pl. 2: fig. 1) with postmarginal vein approximately half as long as marginal vein, and usually twice as long as stigmal vein, postmarginal always longer than stigmal. Hind coxa (Pl. 2: fig. 3) of female in some cases with an inner tooth. Hind femur (Pl. 2: fig. 2) well developed, outer ventral margin with a row of teeth (ranging from 5 to 16), an inner basal femoral tooth present in some cases; hind tibia (Pl. 2: fig. 2) arcuate.

*Abdomen* (Pl. 2: figs. 4 & 5) sessile, with 7 tergites; first tergite always the longest, usually making up a third to a half the length of the gaster; sixth tergite with a pair of spiracles. Ovipositor sheaths compressed; male gastral sternum slightly inflated, apical margin curved.

#### KEY TO ORIENTAL SPECIES OF BRACHYMERIA

1. Clypeus partly or completely fused with the face. Densely pubescent on post clypeus. Hind coxa with a trichoid zone on inner ventral side. Punctures on the thorax distinctly wider than the diameter of the pits . . . . . Subgenus *Matsumurameria* Habu. . . . . 3
- Clypeus not fused. Sparsely pubescent on post clypeus. Hind coxa without a trichoid zone . . . . . 2



2. Gaster short, compact, truncate or subtruncate at apex, occasionally subacuminate . . . Subgenus *Brachymeria* Westwood. . . . . 8  
 Gaster distinctly elongated in the female, usually strongly acuminate at apex (in the male the length of the abdomen is normal and hence difficult to distinguish *Neobrachymeria* from true *Brachymeria*) . . . . .  
 . . . . . Subgenus *Neobrachymeria* Masi. . . . . 6
3. Preorbital carina absent. Postorbital carina present . . . . . 4  
 Preorbital carina absent. Postorbital carina absent. Abdomen liver brownish-red. Hind femora orange red or blackish-red or infuscate with the distal tip yellowish. Tibia yellowish with the base reddish . . . *B. (M.) criculae* Khol.
4. Hind tibia completely yellow with the base black . . . . . 5  
 Hind tibia black with a whitish colouration apically and subbasally. Frontoclypeal suture almost complete but not so distinct as in true *Brachymeria* . . .  
 . . . . . *B. (M.) ryukyuensis* Habu
5. Clypeus distinct and raised dorso-medially, but fused laterally. Punctures on the thorax extremely small and interspaces wide and shining. (In this case the presence of trichoid sensillae on the hind coxa is not clearly ascertained) . . . . . *B. (M.) nitida* Joseph *et al.*  
 Clypeus fused dorso-medially. Only smooth short anteclypeus visible . . .  
 . . . . . *B. (M.) taiwana* Habu
6. Hind femora black with apical yellow patch . . . . . 7  
 Legs mostly black. Hind femora completely black . . . . .  
 . . . . . *B. (N.) inornata* Masi\*
7. Postorbital carina present. Hind tibia black basally and medially . . . . .  
 . . . . . *B. (N.) nosatoi* Habu  
 Postorbital carina absent. Hind tibia yellow with the base black . . . . .  
 . . . . . *B. (N.) ghani*, sp. nov.
8. Coxa with an inner ventral tooth or protuberance in female . . . . . 9  
 Coxa without an inner tooth or protuberance both in male and female . . . 17
9. Scutellum emarginate . . . . . 10  
 Scutellum not emarginate . . . . . 11
10. Hind femora reddish or orange-brown; apex with a small yellow patch. Hind tibia yellow with the base dark reddish and having a dark brownish-red band along the ventral carina on outer and inner sides. Parasitic on *Utetheisa pulchella* and *Earias* sp. . . . . *B. bengalensis pulchellae* Joseph *et al.*  
 Hind femora liver brownish-black with the distal tips of femora faintly yellowish. Hind tibia liver brownish-black with the distal tip yellowish . . . . .  
 . . . . . *B. dunensis* Joseph *et al.*
11. Postorbital carina not reaching the genotemporal margin . . . . . 12  
 Postorbital carina reaching the genotemporal margin . . . . . 13

12. Tibia yellow with a blackish ventral carina from base to tip. Interspaces between the punctures on the thorax smooth. Abdomen longer than the length of pronotum, mesoscutum and scutellum combined (♀) . . . . . *B. intermedia* Nees  
Tibia brownish-black with a yellow patch subbasally and apically. Interspaces between the punctures rugose. Abdomen shorter than pronotum, mesoscutum and scutellum combined (♀). Parasitic on *Porthetria* sp. . . . . *B. intermedia porthetrialis* Joseph et al.
13. Hind tibia mostly black . . . . . 14  
Hind tibia mostly yellowish with the base alone blackish . . . . . 16
14. Hind tibia black with apex alone yellow. Hind femur black except the tip where there is a very small blackish-red colouration . . . . . *B. nigrifemorata* Joseph et al.  
Hind tibia black with yellow patches subbasally and apically. Hind femora black with a yellow patch apically . . . . . 15
15. Punctures on the thorax close . . . . . *B. coxodentata* Joseph et al.  
Punctures on the thorax not close. Interspaces of pits as wide as the diameter of the pits on median regions of the scutellum and of the scapulae. In the remaining portions interspaces half as broad as the diameter of the pits . . . . . *B. tapunensis* Joseph et al.
16. Lateral ridges of scrobe not produced in front of the antennal toruli. A smooth area below the scrobe is absent. First abdominal tergite faintly shagreened. Parasitic on *Parnara mathias*. . . . . *B. albotibialis* Ashm.  
Lateral ridges of scrobe produced in front of the antennal toruli; area below scrobe with a smooth median portion. First abdominal tergite not shagreened. Second tergite distinctly punctured. Polyphagous species. Cosmopolitan in distribution. . . . . *B. lasus* Walk.
17. Scutellum emarginate . . . . . 49  
Scutellum weakly emarginate or entire or rounded . . . . . 18
18. Punctures on the scutellum close and less than half as broad as the diameter of the pits . . . . . 19  
Punctures on the scutellum not close . . . . . 46
19. Preorbital carina distinct . . . . . 20  
Preorbital carina faint or absent . . . . . 34
20. Postorbital carina present. . . . . 21  
Postorbital carina absent or indistinct . . . . . 30
21. Base of hind tibia black or brownish-black . . . . . 22  
Base of hind tibia neither black nor brownish-black . . . . . 26
22. Hind tibia with a subbasal yellow patch . . . . . 23  
Hind tibia without a subbasal yellow patch . . . . . 24

23. Scape ( $\delta$ ) almost as long as segments 4-7. Apex of scrobe not interrupted from front ocellus by rugose narrow area. Apex of scutellum entire. Parasitic on *Nephantis serinopa* Meyrick . . . . . *B. nephantidis* Gah.  
Scape ( $\delta$ ) shorter than segments 4-6. Apex of scrobe interrupted from front ocellus by rugose narrow area. Apex of scutellum weakly emerginate. Sub-basal yellow patch much smaller than the yellow patch at apex . . . . . *B. kamijoi* Habu.
24. Scrobe not reaching the front ocellus. Tibia brownish-black except the tip which is yellowish-brown . . . . . *B. raoi* Joseph *et al.*  
Scrobe reaching the front ocellus . . . . . 25
25. Hind femora black with the apex yellowish. Hind tibia black with a brownish patch apically. Postorbital carina branched. Antenna of male with trichoid sensilla on ventral side of funicle . . . . . *B. funesta* Habu.  
Hind femora completely black without a yellow patch at apex. Hind tibia black with a faint brownish colouration at the tip. Postorbital carina not branched . . . . . *B. menoni* Joseph *et al.*
26. Hind tibia with a median blackish or brownish band . . . . . 27  
Hind tibia yellow without a median blackish band but the area along the ventral carina blackish. Hind femur black except for one-fourth of its portion at its tip which is yellowish . . . . . *B. koduvalliensis* Joseph *et al.*
27. Scrobe reaching the front ocellus . . . . . 29  
Scrobe not reaching the front ocellus . . . . . 28
28. Scape ( $\varphi$ ) as long as segments 4-6 combined. Area below scrobe not smooth. Hind tibia pale blackish-brown with yellow patch at the tip and at the base . . . . . *B. wiebesina* Joseph *et al.*  
Scape ( $\varphi$ ) longer than segments 4-7 combined. Area below scrobe with a small smooth portion in the middle.  
Tibia black with the base and apex yellow. *B. longiscaposa* Joseph *et al.*
29. Hind tibia black with the basal area prominently yellow and dorso-apical area brownish-yellow. Fifth segment of the hind tarsi twice as long as wide . . . . . *B. hime* Habu  
Hind femur and tibia more prominently yellow at apical part than that of *B. hime*. Fifth segment of hind tarsus three times as long as wide. Parasitic on *Atteva fabriciella* . . . . . *B. hime attevae* Joseph *et al.*
30. Hind tibia with the base black or dark brown . . . . . 31  
Hind tibia base not black or dark brown but may be reddish or yellowish . . . . . 33
31. Very small species measuring about 1.5-2.0 mm. in length. Hind femur liver-brownish with the distal tip pale yellowish. Hind tibia liver-brownish with small yellowish patches subbasally and apically. Parasitic on *Apanteles plutellae* . . . . . *B. excarinata plutellae* Joseph *et al.*

- Medium sized species of about 3-4.5 mm. in length . . . . . 32
32. Scrobe reaching the front ocellus. Hind tibia black with clear yellowish patches subbasally and apically . . . . . *B. excarinata* Gah.  
 Scrobe slightly distant from front ocellus. Hind tibia black with the base faintly reddish and with small yellow patches subbasally and apically . . . . . *B. inermis* Fonscolombe.
33. Hind tibia yellow without a median blackish band. First abdominal tergite pitted . . . . . *B. carinata* Joseph *et al.*  
 Hind tibia yellow at almost basal one-third and apical one-third. Reddish black at median one-third . . . . . *B. shansiensis* Habu.
34. Postorbital carina present and not faint . . . . . 35  
 Postorbital carina faint or absent . . . . . 39
35. Hind tibia black or brownish basally . . . . . 36  
 Hind tibia with a blackish band medially. Base and apex yellowish. Scrobe not reaching front ocellus. Apex of scutellum completely rounded. . . . . *B. secundaria* (Ruschka)
36. Hind tibia mainly black or brownish-black . . . . . 37  
 Hind tibia mainly yellow with the base alone black. Second tergite vaguely punctured in the female. Punctures almost absent in the male. Gaster short, not distinctly acuminate . . . . . *B. euploaeae* Westwood (*B. hearseyi* var. *xanthotenus* Waterst.)
37. Hind tibia with yellow colouration subbasally and apically . . . . . 38  
 Hind tibia brownish-black with a yellow colouration at the distal end . . . . . *B. hearseyi* Kirby
38. Scutellum weakly emarginate at apex. Area below scrobe uniformly carinate without any distinct large smooth area. Hind tibia mostly black except for a pale blackish-yellow patch at the subbasal part and another pale blackish-yellow area at the distal region . . . . . *B. punctifrons* Joseph *et al.*  
 Scutellum with rounded apex. Area below scrobe smooth and glabrous. Hind tibia yellow with dark brown or black at base and middle . . . . . *B. banksi* Ashmead
39. Hind tibia with the base black or brown. . . . . 40  
 Hind tibia with the base yellow . . . . . 41
40. Hind tibia with a median blackish or brownish band . . . . . 42  
 Hind tibia without a median blackish or brownish band. . . . . 44
41. Hind tibia black with the apex and base yellow . . . . . *B. apicornis* Cameron  
 Hind tibia yellow with the ventral region brownish, this colouration extending slightly to dorsal region in the middle . . . . . *B. shansiensis vietnamensis* Joseph *et al.*

42. Hind tibia yellow subbasally and apically . . . . . 43  
 Hind tibia black with the apical portion alone yellowish. Lateral ridges of scrobe not produced in front of the antennal toruli. Hind femora black with small yellow apical spot . . . . . *B. carbonaria* Zehntner
43. Somewhat large species (4.25-4.40 mm.) Hind tibia blackish-brown with yellowish colouration subbasally and apically. Parasitic on *Aspidiomorpha milaris* F. . . . . *B. burksi* Chhotani  
 Very small species for the genus *Brachymeria* (length 1.5 mm.). Hind tibia pale yellow with black in the middle and at the base. Lateral ridges of scrobe not produced in front of the antennal toruli. Parasitic on *Prodenia* . . . . . *B. prodenia* Ashmead
44. Abdomen red. Postorbital carina faint and branched. Hind femora liver brownish with small yellow patch at apex. Base and ventral carina of hind tibia liver brown, the rest of the portions yellowish . . . . . *B. semirufa* Walk.  
 Abdomen black or faintly reddish . . . . . 45
45. Hind femur often reddish-brown with blackish patches of varying size on its outer side and with yellow patch at the apex. Area below scrobe uniformly punctate. Vertex faintly pitted . . . . . *B. jayaraji* Joseph *et al.*  
 Hind femur black except the distal tip which is yellow. Vertex distinctly pitted. Area below scrobe with a median raised smooth portion. Preorbital carina faint. Parasitic on *Diaphania indica* . . . . . *B. margaroniae* Joseph *et al.*
46. Preorbital carina present. Post-orbital carina weak. Interspaces on the scutellum as broad or half as broad as the diameter of the pits. Hind femora black with a distal yellow patch. Hind tibia blackish with yellow patches subbasally and apically and with the base pale brownish-yellow. Parasitic on *Eublemma amabilis* from *Laccifer lacca* . . . . . *B. tachardia* Cam.  
 Preorbital carina absent or weak . . . . . 47
47. Hind tibia yellow with the base brownish-black. Postorbital carina weak. Interspaces on the scutellum broad, i. e., more than the diameter of the pits. Parasitic on *Simplicia robustalis* . . . . . *B. nursei* Cam.  
 Hind tibia mostly black . . . . . 48
48. Hind tibia with small subbasal and apical yellowish-brown patches. Preorbital carina weak. Scrobe not produced. Antenna swollen towards the apex. Scape much longer than funicular segments 4-6 in male . . . . .  
 . . . . . *B. thracis* Crawf. or *B. medicina* Joseph *et al.*  
 Hind tibia with a yellow patch at the dorso-lateral side at the distal end (without a yellow patch subbasally). Lateral ridges of scrobe produced in front of the antennal toruli. Area below scrobe smooth in the middle. Interspaces between the pits narrow except in the middle of the scutellum where the interspaces are a little more than the diameter of the pits . . . . .  
 . . . . . *B. nigritegularis* Joseph *et al.*
49. Punctures on the scutellum close and less than half as broad as the diameter of the pits (In *B. fiskei* Habu the punctures are close but with a long narrow unpitted area at middle on the scutellum). . . . . 50

- Punctures on the scutellum not close, half as broad as the punctures or more than half. . . . . 69
50. Preorbital and postorbital carinae distinct. . . . . 62  
Preorbital carina faint or absent. Postorbital carina may or may not be present. . . . . 51
51. Postorbital carina absent. Hind femur mainly red with often a blackish spot at the middle. Hind tibia ivory white but blackish along ventral edges and with a dark basal ring. . . . . *B. amphissa* Walk.  
Postorbital carina present. . . . . 52
52. Base and apex of hind femora yellow. . . . . 53  
Base of hind femora not yellow. . . . . 56
53. Hind femur black in the median dorsal portion (rarely yellow) . . . . .  
. . . . . *B. femorata* (Panzer)  
Hind femur yellow in the median dorsal portion . . . . . 54
54. Hind femora mostly yellowish with a narrow median blackish colouration . . .  
. . . . . *B. ornatipes* Cam.  
Hind femora with a large median blackish colouration . . . . . 55
55. Pubescence on body and abdomen golden yellow and dense. Scape longer than segments 4-6 combined (♀). Abdomen longer than pronotum, mesoscutum and scutellum combined (♀). Individuals bigger in size than in *B. megaspila* Cam. . . . . *B. auratopubescens* Joseph et al.  
Pubescence on body silvery grey. Scape not longer than segments 4-6 combined (♀). Abdomen a little shorter than pronotum, mesoscutum and scutellum combined (♀) . . . . . *B. megaspila* Cam.
56. Abdomen yellowish-orange coloured . . . . .  
. . . . . *B. croceogastralis* Joseph et al.  
Abdomen black or faintly reddish . . . . . 57
57. Hind femora black or reddish-black with a yellow or whitish-yellow apical patch . . . . . 59  
Hind femora red or brown with or without a yellow apical spot. In some cases hind femur red with a black patch on its outer side . . . . . 58
58. Hind femur reddish or brownish with yellow apical spot and in some cases with a blackish patch on the outer side. Hind tibia yellow with the base brownish or blackish . . . . . *B. bengalensis* Cam.  
Hind femur red without a yellow apical spot. Hind tibia blackish but merging with red basally and (very narrowly so) apically . . . . .  
. . . . . *B. alternipes* Walk.
59. Hind tibia yellow with a black band basally. Abdomen distinctly longer than pronotum, mesoscutum and scutellum combined (♀). Large species. About 7.25 mm. in length in female and 6.50 mm. in male. . . . .  
. . . . . *B. gigantea* Joseph et al.



- Hind tibia black or brown with subbasal and apical yellow patches . . . 60
60. Postorbital carina branched. Scape blackish without a yellow patch . . .  
 . . . . . *B. hattoriae shillongensis* Joseph *et al.*  
 Postorbital carina not branched. There is a yellowish patch at the basal area of  
 the scape . . . . . 61
61. Scutellum high and more convex in lateral view, strongly and almost perpendi-  
 cularly declined posteriorly . . . . . *B. coloradensis* Cresson \*  
 Scutellum not high in lateral view. Gently declined posteriorly . . . . .  
 . . . . . *B. hattoriae* Habu
62. Hind femora black or ferrugineous or light brown and with or without a tan spot  
 apically . . . . . 63  
 Hind femora black or reddish with a distinct apical yellow spot . . . 65
63. Hind femora black with an apical tan spot. Hind tibia completely black. Scutel-  
 lum with a median longitudinal carina . . . . . *B. lugubris* Walk.  
 Hind femur ferrugineous or red, without a tan spot . . . . . 64
64. Hind femur ferrugineous with a darker spot externally on disc nearer to base.  
 Hind tibia ferrugineous with the apical one-fourth yellowish-white . . .  
 . . . . . *B. atridens* Waterst.  
 Hind femur light brown without a darker spot externally. Hind tibia dark-brown  
 with the basal one-fourth white. . . . . *B. aganoxenae* Fullaway
65. Hind tibia black or ferrugineous at base and at middle with subbasal and apical  
 yellowish or whitish patches. . . . . 67  
 Hind tibia yellowish or brownish-yellow at base. . . . . 66
66. Hind tibia yellowish or brownish-yellow at base and apex. Middle portion black  
 or reddish-black. Scutellum with rather long narrow unpitted space at  
 middle, but without a longitudinal carina. Larger species measuring 7-8 mm.  
 (♀). . . . . *B. fiskei* Crawford  
 Hind tibia completely yellow. Scutellum with a longitudinal carina. . . .  
 . . . . . *B. scutellocarinata* Joseph *et al.*
67. Sixth abdominal tergite weakly pitted. . . . . 68  
 Sixth abdominal tergite distinctly pitted. Hind femora red with apical yellow  
 patch. Hind tibia reddish with subbasal and apical yellow patches. (Pun-  
 ctures on the thorax in some cases half as broad as the diameter of the  
 punctures). Individuals comparatively smaller in size than *B. fonscolombei*  
 and *B. minuta*. . . . . *B. borneanus* Cam.
68. Hind femora usually red in female with an apical patch. Hind tibia also reddish  
 with apical and subbasal patches. In typical form this apical patch of the  
 hind femora and the subbasal and apical patches of the hind tibia are whitish.  
 Hind femora narrower, viz., they are one and four-fifth times to a little more  
 than twice as long as wide. . . . . *B. fonscolombei* Dufour

\* Not reported but are likely to be present in the Oriental Region.

- Hind femora usually black with yellow apical patch usually extending to the inner side. Hind tibia mostly black. Apical and prebasal part yellow or brownish-yellow. Hind femora not more than one and four-fifth times as long as wide . . . . . *B. minuta* Linne
69. Preorbital carina present . . . . . 71  
 Preorbital carina absent . . . . . 70
70. Postorbital carina absent. Interspaces half as broad as the diameter of the punctures. Abdomen longer than the thorax. Legs dull-red, slightly piceous . . . . . *B. xerxena* Walk.  
 Postorbital carina present. Hind femora black except the apices which are rufescent. Hind tibia brownish-black with subbasal and apical yellow patches. Interspaces half or as broad as the diameter of the pits . . . . . *B. fulvitarsis* Cam.
71. Femur black with almost half the distal portions yellow. Punctures on the scutellum half or as broad as the diameter of the pits. Parasitic on *Calopepla leayana* . . . . . *B. minuta calopeplae* Joseph et al.  
 Femur brownish-red with the distal tips pale yellow. The reddish or brownish colouration of the legs are variable. Punctures on the scutellum widely scattered and more than the diameter of the pits. Interspaces smooth . . . . . *B. podagrica* Fabricius

Species unplaced in the Key (for want of details).

*B. jambolana*  
*B. eccentrica*  
*B. garutianus*  
*B. javensis*  
*B. wittei*  
*B. alphius*  
*B. tarsalis*

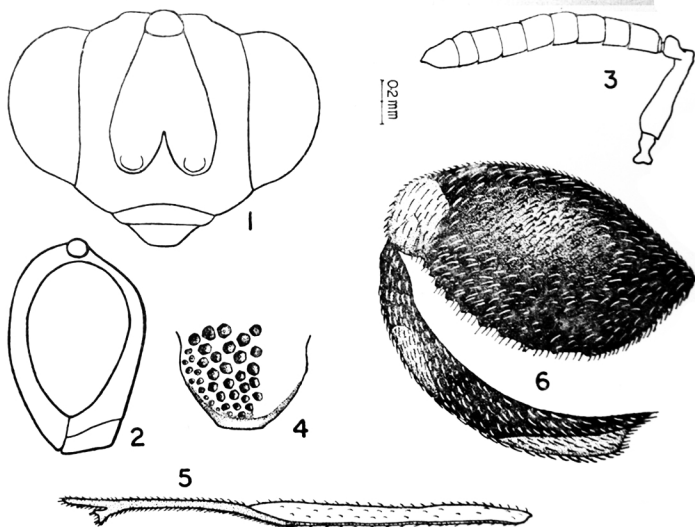
SUBGENUS **BRACHYMERIA** WESTWOOD

Antennae inserted above level of ventral margin of compound eyes. Scrobe relatively narrow, parascrobal space wide, hind coxa in some cases with a ventromesal tooth in female. Gaster compact, subacuminate, never elongate and acuminate. Type species:— *Chalcis minuta* Fabricius (designated by Westwood, 1839).

**1. *Brachymeria coxodentata* Joseph et al. (1: Figs. 1–6)**

1970. *Brachymeria coxodentata* Joseph et al, *Oriental Ins.*, **4** (3): 281–283.

*Female*: Length 3.3 to 3.4 mm. Black; tegulae pale yellowish-brown. Tip of the fore femur, tibia and tarsus dull yellow with a brownish patch on the inner side near the base of the fore tibia. Mid femur at its tip, tibia and tarsus dull yellow except for a blackish-brown patch near the base of the tibia on the inner side. Hind coxa



1: Figs. 1–6. — *Brachymeria coxodentata* Joseph et al. (♀)

1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, fore wing venation; 6, hind femur and tibia

black; femur black, except the tip where it is pale blackish-yellow; hind tibia mostly black except for two pale blackish-yellow patches subbasally and distally; tarsus dull yellow. Pubescence whitish and sparse.

*Head* (Fig. 1) a little wider than the maximum width of the thorax and a little over one and one-third as wide as its own length; surface of the head pitted with the interspaces minutely rugose; surface of the scrobe smooth and shiny, length about one and one-third its maximum width; parascrobal space a little less than one-third as wide as the width of scrobe; scrobe deep occupying about two-thirds the width of interocular space, attaining the front ocellus; length of eye two and one-fifth times its width; median and the lateral ocelli of equal diameter; the distance between median and lateral ocelli is equal to half the interocellar distance; interocular space equal to thrice the interocellar distance. Width of clypeus about four and two-thirds as wide as its median length; width of labrum about two and a half times its median length; width of ocellar area a little over two-thirds the width of interocular space; interocellar distance about one and a half times as wide as the maximum diameter of the lateral ocellus; preorbital carina absent (Fig. 1); postorbital carina present reaching the genotemporal margin (Fig. 2); the lateral ridges of scrobe not represented in front beyond the antennal toruli; height of malar space about one-third the height of eye; the front genal and hind genal angles almost rectangular and as in figure. Antenna (Fig. 3) rather thin; scape not exceeding the front ocellus, distinctly longer than the combined length of segments four to six, contracted in the middle part; pedicel a little longer than wide; ring segment a little over five times as wide as long; fourth segment distinctly longer than wide; fifth and sixth segments of equal length; sixth a little wider than fifth; fifth and sixth segments slightly shorter than fourth segment; seventh segment a little shorter than sixth; eighth as long as segment six; ninth segment as long as segment seven; tenth segment a little longer than segment nine; eighth segment widest of the funicular segments; club hardly a little over twice as long as its maximum width.

*Thorax* provided with distinct, umbilicate, reticulate, rounded and close pits with seta arising in each pit; the interspaces rugose and narrow, except in the median portions of scutellum (Fig. 4) where interspaces are half the diameter of the punctures; mesoscutum a little less than twice as wide as long; parapsidal furrows distinct; scutellum about one and one-third as wide as long, moderately high in lateral view, gently declined posteriorly, apical margin explanate and entire

with moderate pubescence and as in figure. Fore wing thrice as long as wide; pubescence sparse in the basal one-fourth and close in the rest of wing membrane; marginal vein (Fig. 5) about three-fifths the submarginal vein; postmarginal vein about one-third the marginal vein and about two and one-third times as long as stigmal vein. Hind coxa distinctly punctate with sparse pubescence and with an inner tooth; hind femur (Fig. 6) about one and three-fourths as long as wide, outer and inner sides rugose with close pubescence, outer ventral margin with ten teeth as in figure; hind tibia little longer than hind femur.

*Abdomen* about as long as the length of pronotum, mesoscutum and scutellum combined, highest after the middle, about one and a half times as long as its own height; first tergite shagreened with sparse pubescence on the basolateral regions; sixth tergite closely pitted and well pubescent with five to six rows of close pits, eleven to twelve pits in each row.

*Holotype* ♀. Coll. No. 172, on pin and its antenna, wing and femur on slides Nos. 11, 12 and 13 respectively; *Paratype* 1 ♀, Coll. No. 171, on pin; INDIA: Mavoor Road, Calicut, Kerala, Coll. Joseph, Lal and John, No. 172 on 6. viii. 1967 and No. 171 on 30. vii. 1967. Holotype will be deposited in Indian Agricultural Research Institute, New Delhi; Paratype deposited in U. S. National Museum, Washington.

*Specimens examined*: Two specimens (Coll. No. 593 and 688) from the collections of Bishop Museum, Honolulu.

*Distribution*: India, Philippines and Vietnam.

*Host*: Unknown.

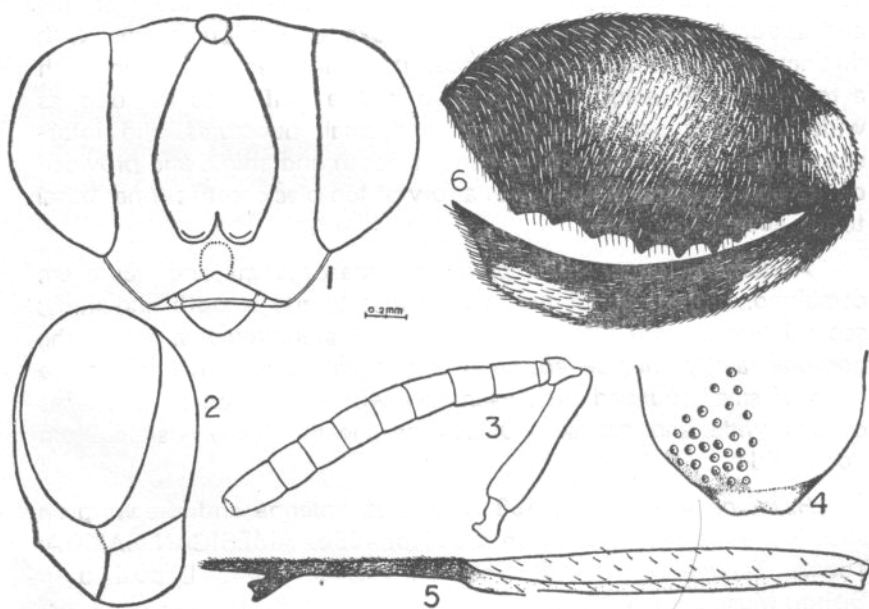
*Affinities*: *B. tapunensis* Joseph *et al.* resembles this species in the following respects: (i) the presence of a coxal tooth on the hind coxa; (ii) absence of preorbital carina; (iii) similarity of colouration of hind leg. But it differs from *B. coxodentata* in having: (i) the interspaces of pits wide on the median regions of scutellum and on scapulae; (ii) in the presence of a median, elevated and smooth area below scrobe; (iii) abdomen longer than the combined length of pronotum, mesoscutum and scutellum.

## 2. *Brachymeria tapunensis* Joseph *et al.* (2: Figs. 1–6)

*Female*: Length 5.68 mm. Black, tegulae yellow. Coxae, trochanters and femora black except the distal tips of femora which are yellowish on the dorsal side. Front tibiae black except the base and apex which are yellowish, this yellow colouration extending from the

base to apex on the dorsal side. Mid tibiae black except the base and apex which are yellow. Hind tibia black with a yellow colouration on the dorso-lateral side at the subbasal area and on the dorsal side at the tip. Fore and mid tarsi brownish-yellow. Hind tarsi blackish-brown. Pubescence moderate and dirty-white.

**Head** (Fig. 1) a little wider than the thorax, about one and one third as wide as long; surface of head distinctly pitted; interspaces and inside of pits rugose. Scrobe deep, smooth and shiny; the maximum width of scrobe a little less than two-thirds the interocular space, attaining the front ocellus. Length of scrobe one and one-third its maximum width; parascrobal space one-fifth the width of scrobe. Length of eye (Fig. 1) two and one-fifth its width; median ocellus a little larger than lateral; the distance between median and lateral ocelli one-fourth the interocellar distance; interocular space two and a half times interocellar distance. Width of clypeus five times its median length; width of labrum a little more than two times its median length; width of ocellar area a little more than three-fourths interocular space; interocellar distance a little more than two times the maximum diameter of the lateral ocellus. Frons without pre-orbital carina; postorbital carina (Fig. 2) present, reaching the



2: Figs. 1-6. — *Brachymeria tapunensis* Joseph et al. (♀)

1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, fore wing venation; 6, hind femur and tibia.

genotemporal margin. Area below scrobe with a median smooth raised portion; lateral ridges of scrobe not produced in front of the antennal toruli; inter-antennal projection short; height of malar space (Fig. 1) a little less than one-third the height of eye; front genal angle slightly acute, hind genal angle rounded and slightly obtuse. Antenna (Fig. 3) fairly stout, scape not exceeding the front ocellus, longer than segments four to six combined, contracted before the middle; pedicel a little longer than wide; ring-segment width twice its length; width of funicular segments gradually increasing from segment four to ten.

*Thorax* provided with rounded and umbilicate pits; interspaces of pits as wide as the diameter of pits in the median regions of the scutellum (Fig. 4) and of the scapulae; in the remaining portions half as broad as the diameter of pits. Width of mesoscutum a little less than one and three-fourths its length; scutellum almost as long as wide, moderately high in profile, gently declined posteriorly, apical flange explanate and slightly emarginate, with moderate pubescence. Fore wing a little more than two and two-thirds as long as wide; pubescence sparse in the basal one-fourth and dense in the rest of the wing membrane; marginal vein (Fig. 5) a little more than half the submarginal; postmarginal a little less than one-third the marginal and about twice the stigmal. Hind coxa on its outer side with distinct punctures and pubescence, its inner ventral margin with a tooth. Hind femur (Fig. 6) two and a half times as long as wide, its outer side with distinct and small punctures, the interspaces between the punctures being smooth and shiny, and provided on its outer ventral margin with a row of ten black teeth; inner basal tooth absent.

*Abdomen* longer than pronotum, mesoscutum and scutellum combined, highest about the middle; first tergite smooth and shiny; second tergite with pits on the basal and lateral regions, rest of the portions faintly shagreened; sixth tergite with about five transverse rows of small rounded pits, each row with 4 to 15 pits; interspaces of pits wide and rugose. Ovipositor sheath clearly visible from dorsal side.

*Holotype* ♀, coll. No. 458 on pin, its antenna and fore wing on slide No. 458a and hind leg on slide No. 458b. AMERICAN SAMOA: Tutvila, Tapuna, Coll. N. R. Spencer, 10. vii. 1964. Deposited in Bishop Museum, Honolulu.

*Distribution:* American Samoa, Philippines.

*Hosts:* Unknown.

**Affinities:** This species resembles *B. coxodentata* Joseph *et al.* in the following respects: (i) the presence of a coxal tooth on the hind coxa; (ii) absence of preorbital carina; (iii) similarity of colouration of hind leg. But it differs from *B. coxodentata* in having: (i) the interspaces of pits wide; (ii) in the presence of a median, elevated and smooth area below scrobe; (iii) abdomen longer than the combined length of pronotum, mesoscutum and scutellum.

This species also resembles *B. intermedia porthetrialis* Joseph *et al.* in many respects but differs from it in the following characters: (i) postorbital carina reaching the genotemporal margin and not branched; (ii) pits on the thorax not close and interspaces of pits wide; (iii) lateral ridges of scrobe not produced in front of the antennal toruli; (iv) first tergite not shagreened; (v) abdomen longer than the combined length of pronotum, mesoscutum and scutellum.

### 3. *Brachymeria dunensis* Joseph *et al.* (3: Figs. 1-7)

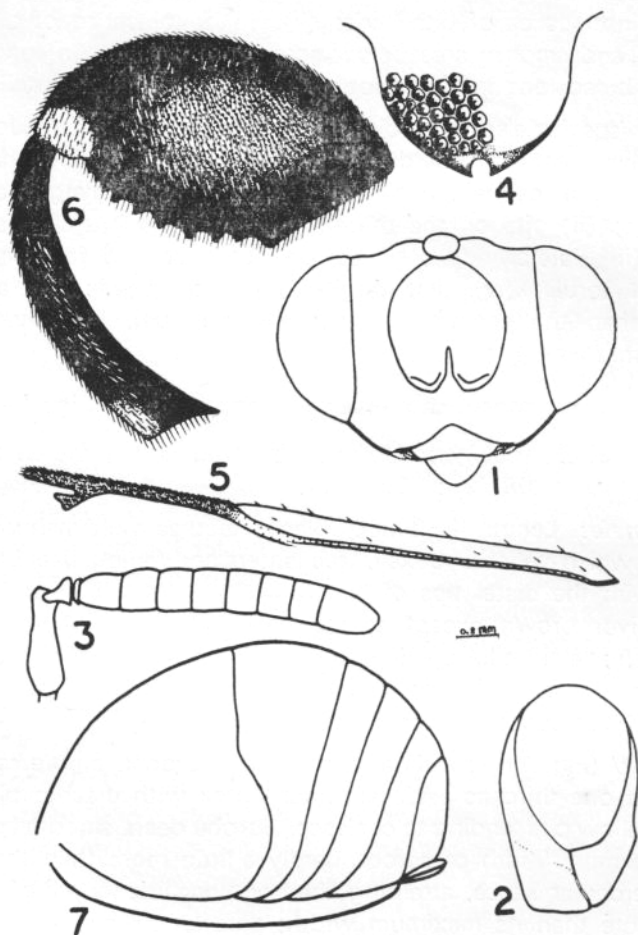
1972. *Brachymeria dunensis* Joseph *et al.* *Indian Forester*, **98** (9): 552-554.

**Female:** Length 4.32 mm. Black; tegulae yellowish with base pale brownish-yellow. Coxae, trochanters and femora liver brownish-black with the distal tips of femora faintly yellowish. Fore and mid tibiae liver brown except at the base and apex where they are yellowish; tarsi yellow. Hind tibia liver brownish-black with distal tip yellowish as in figure; tarsi yellowish. Abdomen liver brownish-black. Pubescence moderate and silvery.

**Head** (Fig. 1) as wide as the width of thorax, a little more than one and one-third as wide as long; vertex with distinct pits; frons with shallow pits tending to coalesce. Scrobe deep, smooth and shiny; the maximum width of scrobe hardly a little more than three-fifths the interocular space, attaining the front ocellus; length of scrobe a little more than its maximum width; parascrobal space a little less than one-third the maximum width of scrobe. Length of eye (Fig. 1) one and two-thirds its width; median ocellus larger than lateral; the distance between median and lateral ocelli a little more than one-third the interocellar distance; interocular space a little less than three times the interocellar distance; interocellar distance a little less than three times the ocellocular distance. Width of clypeus about four times its median length; width of labrum about twice its median length; width of ocellar area a little over two-thirds the interocular space; interocellar distance a little more than two times the maximum diameter of the lateral ocellus. Frons without preorbital carinae,



postorbital carinae absent (Fig. 2), area below scrobe without a median smooth portion; lateral ridges of scrobe not produced in front of the antennal toruli; inter-antennal projection moderately developed; height



3: Figs. 1-7. — *Brachymeria dunesis* Joseph et al. (♀)

1, head in front view; 2, head in lateral view; 3, antenna;

4, scutellum in dorsal view; 5, fore wing venation; 6, hind femur and tibia;

7, abdomen in lateral view.

of malar space (Fig. 1) two-fifths the height of eye; front genal angle slightly acute, hind genal angle slightly obtuse or nearly rectangular. Antenna (Fig. 3) fairly stout, scape slightly or not reaching the front ocellus, shorter than segments four to six combined, contracted after the middle; pedicel almost as wide as long; ring segment width five

times its length. Segment four longer than five; segments five to seven subequal in length and segments eight to ten subequal in length; width almost equal from segments five to ten. Club a little less than two times its width.

*Thorax* provided with reticulate, rounded, umbilicate and close pits (Fig. 4); interspaces of pits narrow and rugose. Width of mesoscutum one and four-fifths its length; scutellum length subequal to its width, high in lateral view, fairly gently declined posteriorly, apical flange emarginate (Fig. 4) and explanate with moderate pubescence. Fore wing about two and a half times as long as wide; marginal vein (Fig. 5) a little less than half the submarginal; post marginal about one-third the marginal and about twice the stigmal. Hind coxa on ventral side with shallow pits and moderate pubescence with an inner tooth; its dorsal side smooth and shiny. Hind femur (Fig. 6) a little less than twice as long as wide; its outer side with minute distinct punctures and pubescence; ventral margin of outer side with 10 teeth; inner side with fewer punctures and pubescence than on outer side and without a basal tooth.

*Abdomen* (Fig. 7) length subequal to pronotum, mesoscutum and scutellum combined; first tergite faintly shagreened and shiny; second tergite with a few pits on the baso-dorsal and lateral sides, rest of the portions finely shagreened; sixth tergite with seven to eight transverse rows of distinct pits, each row with several pits. Ovipositor sheath slightly or not visible from dorsal side.

*Holotype* ♀, Coll. No. 1695 on pin, its antenna and fore wing on slide No. 1695a. INDIA, Dehra Dun, F. R. I. compound, Coll. N. C. Chatterjee on 30-x-1925, from *Desychira* pupae. *Paratypes* 2 ♀♀, Coll. Nos. C. U. 1693 and 1694 on pins, collection data same as for the holotype. Types deposited in Forest Research Institute, Dehra Dun.

*Distribution:* India

*Host:* *Dasychira* pupa (Fam. Lymantriidae)

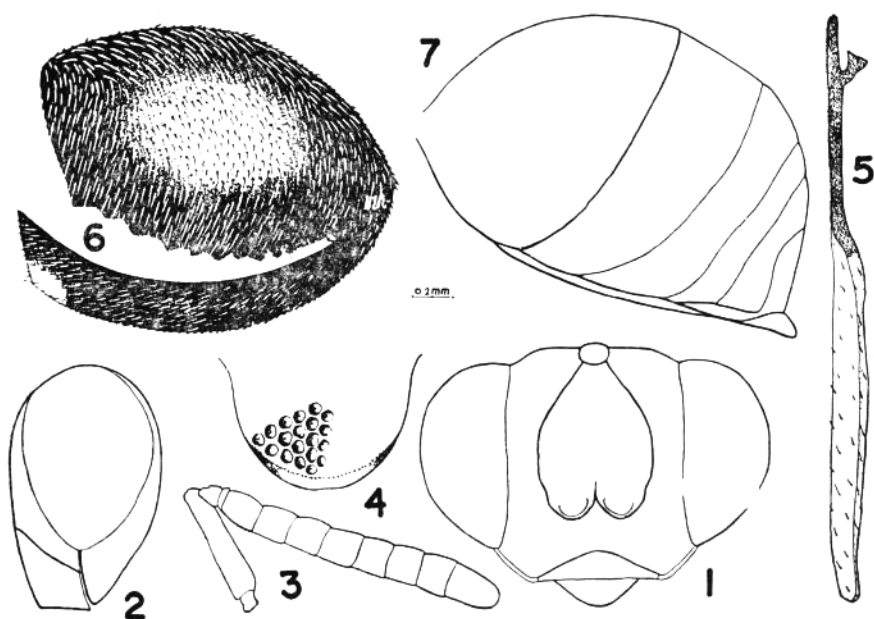
*Affinities:* This species resembles *B. nigrifemorata* Joseph *et al.* in: (i) colouration; (ii) the presence of a coxal tooth; (iii) the absence of preorbital carina. But *B. nigrifemorata* can be indentified from this species in having: (i) the apical flange of the scutellum rounded and not emarginate; (ii) postorbital carina present; (iii) scape (♀) longer than segments four to six combined.

#### 4. *Brachymeria nigrifemorata* Joseph *et al.* (4: Figs. 1-7)

*Female:* Length 4.8 mm. Black; tegulae pale reddish brown with a pale yellow patch on the posterior side. Fore and mid coxae,

trochanters and femora black except the distal tips of femora which are brownish-yellow. Fore tibia black except at the base and apex which are brownish-yellow and this brownish-yellow colouration extends from base towards apex on dorsal side; tarsus pale brownish-yellow. Mid tibia black except at base and apex where it is brownish-yellow; tarsus pale brownish-yellow. Hind coxa, trochanter and femur black except at the tip of the femur where there is a very small blackish-red colouration; tibia black except at the tip on the dorsal side where it is blackish-red; tarsus pale brownish-yellow. Pubescence moderate and whitish.

*Head* (Fig. 1) a little wider than the width of thorax, hardly a little more than one and one-third its own length; surface of head distinctly pitted, interspaces of pits carinate and rugose. Scrobe



4: Figs. 1-7. — *Brachymeria nigrifemorata* Joseph *et al.* (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, fore wing venation;  
6, hind femur and tibia; 7, abdomen in lateral view.

deep, smooth and shiny; the maximum width of scrobe a little less than three-fourths the interocular space, attaining the front ocellus; length of scrobe a little less than one and a half times its width; parascrobal space a little less than one-third the width of scrobe.

Length of eye (Fig. 1) hardly a little more than one and a half times its width; median ocellus a little larger than lateral; the distance between median and lateral ocelli two-fifths the interocular distance; interocular space a little less than three times interocular distance; interocular distance two and a half times ocellocular distance. Width of clypeus four and a half times its median length; width of ocellar area a little less than three-fourths interocular space; interocular distance a little less than two times the maximum diameter of the lateral ocellus. Frons without preorbital carinae; postorbital carina present, reaching the genotemporal margin (Fig. 2); area below scrobe without a median smooth portion; lateral ridges of scrobe not produced in front of the antennal toruli; inter-antennal projection thin and short; height of malar space (Fig. 1) a little less than one-third the height of eye. Front genal angle slightly acute, hind genal angle slightly obtuse. Antenna (Fig. 3) fairly stout; scape not exceeding the front ocellus, longer than segments four to six combined, contracted after the middle; pedicel as long as wide; ring segment width about four times its length; fourth segment longer than fifth; fifth shorter than sixth; seventh and sixth subequal; eighth, ninth and tenth subequal and shorter than seventh; club length one and three-fifths the length of the tenth segment and about one and a half times as long as its own width; width of funicular segments gradually increasing from the fourth to the tenth segment.

*Thorax* with small, rounded, reticulate and umbilicate pits (Fig. 4), the interspaces of pits narrow and generally smooth, but on the pronotum, anterior side of the mesoscutum and scapulae these are rugose. Mesoscutum a little more than one and three-fifths as wide as long; scutellum a little wider than long, moderately high in lateral view, gently declined posteriorly, apical part explanate and rounded off with moderate pubescence. Fore wing a little more than two and a half times its width; pubescence sparse in the basal one-fourth and dense in the rest of the wing membrane; marginal vein (Fig. 5) a little more than half the submarginal; postmarginal a little less than one-third the marginal, and equal to twice the stigmal. Hind coxa on outer side with distinct punctures and pubescence; inner ventral margin with a distinct coxal tooth. Hind femur (Fig. 6) a little longer than its width; outer side with distinct punctures and pubescence; outer ventral margin with a row of thirteen black teeth (Fig. 6), inner side without a basal tooth; hind tibia a little longer than hind femur.

*Abdomen* (Fig. 7) length almost equal to pronotum, mesoscutum and scutellum combined; highest about the middle; one and

two-thirds as long as its width; first tergite smooth and shiny; second tergite with punctures and pubescence on the basodorsal area and lateral areas; remaining portions finely shagreened; sixth tergite with about seven transverse rows of rounded and deep pits, each row with about seven to twenty pits; interspaces of pits in the median part half as wide as the diameter of the pits. Ovipositor sheath visible from above.

*Holotype* ♀, Coll. No. C. U. 568 on pin; its antenna and fore wing on slide No. 568a and hind leg on slide No. 568b. HONG KONG, TAIPOKAV, Coll. Lae Kit Ming and Huwai Ming on 2-6. vii. 1964. Deposited in Bishop Museum, Honolulu.

*Distribution*: Hong Kong

*Hosts*: Unknown.

*Affinities*: *B. dunensis* Joseph *et al.* resembles this species in having almost common colouration, having a tooth on the inner ventral side of each hind coxa and in the absence of preorbital carina. But *B. dunensis* differs from this species in having: (i) the apical flange of scutellum emarginate; (ii) postorbital carina present, and (iv) scape (♀) shorter than segments four to six combined.

##### 5. *Brachymeria albotibialis* Ashmead (5: Figs. 1-7)

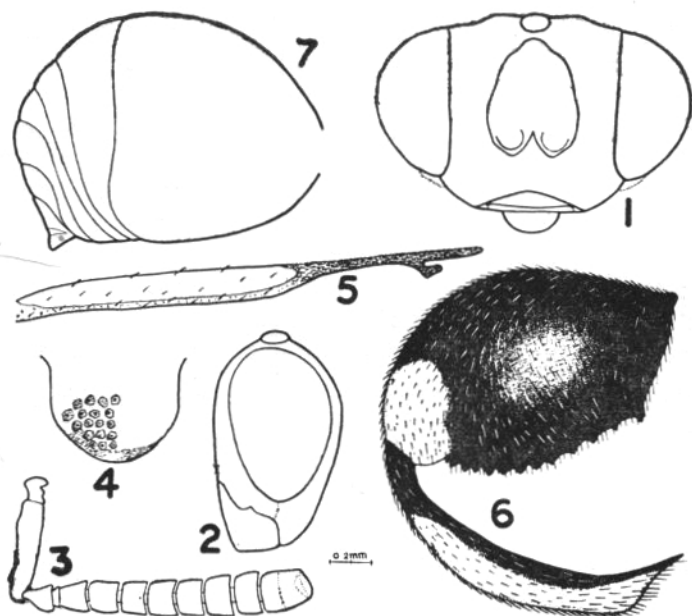
1904. *Chalcis albotibialis* Ashmead, *Journ. N. Y. Ent. Soc.* **XII**, p. 12

1930. *Brachymeria albotibialis* Gahan, *Proc. U. S. Natl. Mus.* **77** p. 12

*Female*: Length 3.6 mm. Black; tegulae immaculate yellow. Coxae and trochanters blackish-brown or black; femora reddish black or black with the distal ends immaculate yellow; front and mid tibiae yellow; hind tibiae yellow with the base reddish black (in some cases faintly reddish or blackish) and this reddish-black colouration extends to the tip along the ventral carina; tarsi yellow with the tip dark-brown. Pubescence silvery white and moderately dense. Abdomen reddish in some cases.

*Head* (Fig. 1) a little wider than the width of thorax, a little less than one and a half its own length; vertex distinctly pitted and interspaces of pits rugose. Scrobe deep, smooth and shiny, its maximum width a little more than half the interocular space, not attaining the front ocellus (Fig. 1); length of scrobe about one and one-third its maximum width; parascrobal space a little less than half the width of scrobe. Length of eye (Fig. 1) a little over twice its width; median

ocellus equal to the lateral ; the distance between median and lateral ocelli two and a half times the interocellar distance ; interocular space two and a half times interocellar distance ; interocellar distance two



5: Figs. 1-7. — *Brachymeria albotibialis* Ashm. (♀)

1, head in front view ; 2, head in lateral view ; 3, antenna ;

4, scutellum in dorsal view ; 5, fore wing venation ;

6, hind femur and tibia ; abdomen in lateral view.

and a half times ocellocular distance. Width of clypeus a little more than five times its median length. Width of ocellar area about three-fourths interocular space ; interocellar distance two and a half times the maximum diameter of the lateral ocellus. Frons without preorbital carina ; postorbital carina (Fig. 2) present, reaching the genotemporal margin ; lateral ridges of scrobe not produced in front of antennal toruli ; area below scrobe with punctures and without a smooth median raised portion ; inter-antennal projection moderate. Height of malar space (Fig. 1) a little less than one-third the height of eye ; front and hind genal angles almost rectangular (Fig. 2). Antenna (Fig. 3) not stout ; scape not exceeding front ocellus, distinctly longer than segments four to six combined, dilated near the middle. Pedicel length subequal to its width. Ring segment two and one-third as wide as long. Fourth and fifth segments subequal ; segments

five to nine subequal; thickness of flagellar segments gradually increasing from segment four to ten.

*Thorax* provided with reticulate, rounded, umbilicate and close pits (Fig. 4); interspaces of pits narrow. Mesoscutum width a little more than twice its length. Scutellum width subequal to its length, high in lateral view, gently declined posteriorly; apical margin explanate and entire with moderate pubescence. Fore wing length hardly a little more than two and a half times its width. Marginal vein (Fig. 5) half the submarginal; postmarginal a little more than one-third the marginal, a little less than three times the stigmal. Hind coxa on the inner ventral side with a distinct tooth, dorsal side shagreened and shiny. Hind femur length one and three-fifths its width; outer side mat with faint almost invisible punctures; outer ventral margin with a row of 13 black teeth (Fig. 6); inner side without a basal tooth. Hind tibia a little longer than hind femur.

*Abdomen* (Fig. 7) distinctly shorter than pronotum, mesoscutum and scutellum combined, highest about the middle. First tergite faintly shagreened. Second tergite finely microsculptured except on the sides and baso-lateral regions of the dorsal aspect. Sixth tergite with about six transverse rows of pits, coarsely pitted with pubescence, each row with about 8 pits. Ovipositor sheath not visible from dorsal side.

*Specimens examined*: ♀, Coll. No. C. U. 1104 (Plesiotype) on pin, its antenna and fore wing on slide No. 1104a and hind leg on slide No. 1104b, S. INDIA: Palur, S. Arcot, Coll. C. V. S. (Full name unknown) from paddy skipper on 7-ix-1918. Det. B. D. Burks. 5 specimens (Coll. Nos. C. U. 1587 to 1591) from the Collections of Indian Agricultural Research Institute, New Delhi.

*Type*: No. 7695 U. S. National Museum. Plesiotype (No. C. U. 1104) will be deposited in the collections of the Indian Agricultural Research Institute New Delhi.

*Distribution*: Philippines and India.

*Host*: Paddy skipper, *Parnara mathias* (Fam. Hesperidae).

*Affinities*: *B. lasus* Walker resembles *B. albotibialis* Ashmead in: (i) the absence of preorbital carinae and the presence of post-orbital carinae; (ii) the similar type of punctation on the thorax; (iii) the almost similar colouration; (iv) presence of tooth on the hind coxa. But *B. albotibialis* can be easily distinguished on account of: (i) the shape of the abdomen which is very different from that of *B. lasus*; (ii) the lateral ridges of scrobe not being produced in

front of the antennal toruli; (iii) absence of smooth median portion below the scrobe; (iv) the first tergite being shagreened.

*B. coxodentata* Joseph *et al.* also resembles *B. albotibialis* but differs in having: (i) the hind tibia almost black with yellow colouration subbasally and apically; (ii) the first tergite of abdomen smooth; (iii) the front and mid tibiae with brownish colouration in the middle.

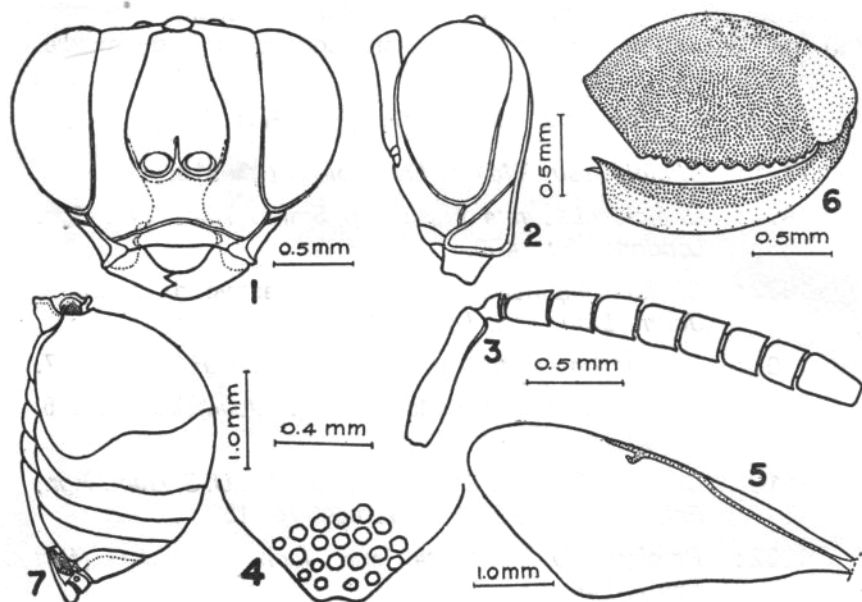
## 6. *Brachymeria lasus* (Walker) (6: Figs. 1 - 7)

- 1941: *Chalcis lasus* Walker, *Entomologist* p. 219.
- 1874: *Chalcis obscurata* Walker, in Smith, *Trans. Ent. Soc. London*: 399 - 400.
- 1883: *Chalcis euploae* Kirby (nec Westwood) (partim), *Journ. Linn. Soc. London, Zool.* **17**: 68.
- 1901: *Chalcis obscurata* Ashmead, *Fauna Hawai* 1: 306-307.
- 1906: *Chalcis obscurata* Banks, *Phillipp. Journ. Sci.* **1**: 215, pl. 4.
- 1910: *Chalcis obscurata* Crawford, *Tech. Ser. U. S. Dept. Agr., Ent.* no. 19, pt. 2: 14, 17, figs. 15, 16.
- 1932: *Brachymeria obscurata* Ishii, *Icon. Ins. Jap. (first edit.)*: 346, fig. 673.
- 1939: *Brachymeria obscurata* Takano et Yanagihara, *Taiwan Kansho Gaikichu Hen*: 245 - 246, pl. 8, fig. 10.
- 1943: *Brachymeria euploae* Sonan (= Minamikawa) (nec Westwood) (partim), *Rep. Gov. Formosa, Agr. Exp. Stat.* **84**: 79 - 83, pl. 2, figs. 10, 10a, 16.
- 1950: *Brachymeria obscurata* Ishii, *Icon. Ins. Jap. (revised, edit.)*: 1405, fig. 4047.
- 1957: *Brachymeria obscurata* Ishihara, *Taxono-agronomic Ent. Jap.*: 392, fig. 174.
- 1960: *Brachymeria obscurata* Habu, *Bull. Natl. Inst., Agric. Sci., C.* No. 11, pp. 168 - 184.
- 1962: *Brachymeria obscurata* (Walker) Habu, *Fauna Japonica* pp. 33 - 46.

*Female*: Length 5.0-7.0 mm. Black; tegulae pale yellow or whitish yellow, with basal part dark reddish-brown, rarely somewhat brownish or orange. Coxae black, shiny; trochanters black; femora shiny black, with apical part clear yellow; fore and mid tibiae clear



yellow, with or without black patch on ventral side, black patch not reaching base nor apex, hind tibiae (Fig. 6) creamy-yellow with the base wholly black or reddish black; yellowish part of legs rarely reddish or orange. Pubescence and bristles on body silvery-white.

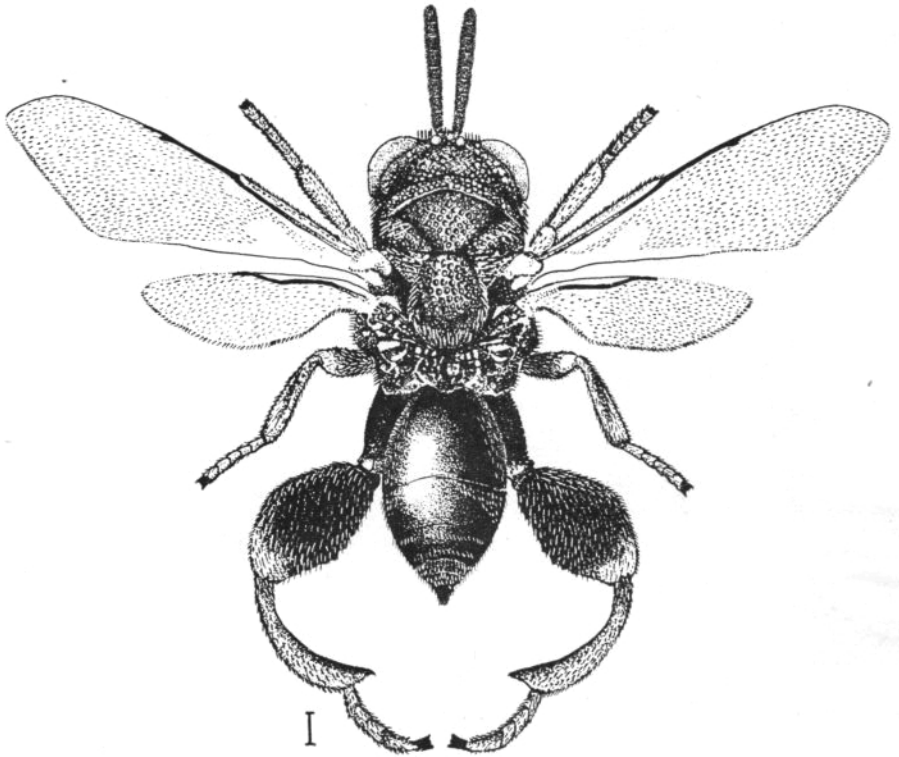


6 : Figs. 1 - 7. — *Brachymeria lasus* (Walker) (♀)

1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, fore wing; 6, hind femur and tibia;  
7, abdomen in lateral view

*Head* (Fig. 1) as wide as thorax; surface distinctly pitted, sometimes faintly pitted though fairly rough, interspaces of pits somewhat carinate in part, area below scrobe with a smooth portion at middle. Surface in scrobe smooth; interocellar distance twice as wide as major axis of hind ocelli; frons generally without preorbital carinae; scrobe deep, occupying two-thirds the width of interocular space, attaining front ocellus; inter-antennal projection fairly narrow thin anterior lamina usually indistinct; height of malar spaces one-fourth to two-sevenths as high as compound eyes; postorbital carina (Fig. 2) distinct, reaching posterior margin of genotemporal regions; front genal angle acute though somewhat rounded, hind angle rectangular, but widely rounded. Antenna (Fig. 3) not thickened towards apex; scape not exceeding front ocellus, a little longer than segments 4 to 6 combined, somewhat dilated at about basal one-third; pedicel

PLATE 3



*Brachymeria lasus* Walker (♀)

almost as long as wide; segments 4 to 7 or 8 slightly longer than wide, equal in length, but very slightly increasing in width; segment 9 or 10 somewhat shorter than preceding; club twice as long as segment 10.

*Thorax* moderately pitted on dorsal side, pits on scapulae generally somewhat smaller, interspaces of pits somewhat wide, rather narrow on mesoscutum and scapulae, but not distinctly carinate on pronotum and with distinct microsculpture, microsculpture often faint or invisible on scutellum; mesoscutum one and one-eighth times as wide as long; scutellum (Fig. 4) high in lateral view, abruptly declined posteriorly, apical part rather widely explanate and reflexed, apex weakly bilobed, lobes often indistinct, sometimes apex rather rounded. Fore wing (Fig. 5) more than two and one-third to less than two and one-half times as long as wide; marginal vein of fore wing one-half as long as submarginal; postmarginal one-third as long as marginal, less than twice as long as stigmal. Hind coxae strongly densely punctate on ventral side, with one protuberance before apex on inner ventral side; hind femora (Fig. 6) one and three-fourth times as long as wide, minutely densely punctate and densely pubescent on both outer and inner sides, microsculpture absent; inner side without protuberance near ventro-basal area, outer ventral margin with eleven to twelve teeth, second tooth sometimes very small.

*Abdomen* (Fig. 7) short and oval, almost as long as or a little shorter than pronotum, mesoscutum and scutellum combined, widest a little before middle, somewhat narrower than thorax; first tergite smooth; second tergite minutely compactly punctate on dorsal area, but with several distinct setiferous punctures on baso-dorsal and latero-dorsal areas, dorsal half of lateral sides with dense, rather large, bristled punctures; sixth tergite with many dense large punctures and distinct microsculpture, densely bristled. Ovipositor sheath visible from above.

*Male*: Length 3.3 — 5.5 mm. Antennae with trichoid sensillae on ventral side of funicle. Hind coxa without protuberance on inner ventral side.

*Specimens examined*: Coll. Nos. C. U. 363, 370, 375, 378, 381, 391, 393, 397, 404, 410, 413, 418, 419, 426 to 429, 431, 432, 441, 442, 459, 460, 464, 467, 485, 486, 491, 494 to 498, 501 to 505, 511, 515, 516, 518 to 521, 523, 524, 526, 527, 530, 531, 533, 535, 541, 543 to 546, 548 to 550, 552 to 554, 556, 557, 559, 563, 565, 566, 576, 578, 581, 596, 610 to 611, 613, 614, 617, 618, 623, 625, 628, 634, 635, 641, 643, 647, 648, 656,

660, 663, 665, 668, 669, 708, 712, 714 and 715 from the collections of Bishop Museum, Honolulu. Coll. Nos. C. U. 757 to 768, 770, 778, 780, 783, 786, 788, 790 to 792, 795 to 801, 805, 806, 810, 811, 813, 814 and 818 from the collections of Rijksmuseum van Natuurlijke Histoire, Leiden. Coll. Nos. C. U. 918 to 937 from the collections of Museum National d'Histoire Naturelle (Paris). Coll. Nos. C. U. 983 to 989 from the collections of Central Plantation Crops Research Institute, Kayamkulam. Coll. Nos. C. U. 1080 to 1094, 1236 to 1255 from the collections of Faculty of Entomology, Tamilnadu Agricultural University, Coimbatore. Coll. Nos. C. U. 1362 to 1432 from the collections of Indian Agricultural Research Institute, New Delhi. Coll. Nos. C. U. 1779 to 1827, 1844, 1859, 1862, 1876, 1893, 1898, 1899, 1901, 1904 to 1906 from the collections of Magyar Nemzeti Museum, Budapest. Coll. Nos. 285 to 294 from the collections of Commonwealth Institute of Biological Control, Bangalore, and about 1500 specimens reared in the laboratory, Department of Zoology, University of Calicut.

*Distribution*: India, Burma, Java, Sumatra, New Guinea, B. N. Borneo, Vietnam, China, Formosa, Japan, Korea, Philippines, Fiji Is. and Hawaii.

*Hosts*: This species attacks pupae of many Lepidoptera, though sometimes parasitises Hymenoptera and Diptera secondarily. It is a polyphagous species.

*Remarks*: The above account of *Brachymeria lasus* (Walker) is based on the description of *Brachymeria obscurata* (Walker) given by Habu (1960).

Many authors regard *B. obscurata* (Walker) as synonymous with *B. euploaeae* Westwood. Dr. Boucek is of the opinion that *B. obscurata* is one of the many synonyms of *B. lasus* which, according to him, is the oldest and valid name for the species. As per our request he has been kind enough to give his opinion regarding the synonymy of this species with *B. euploaeae* (Westwood). He has seen the type materials of *B. lasus* (= *obscurata*) and *B. euploaeae* and he considers that *B. euploaeae* is a distinct species. According to him, unlike *B. lasus*, *B. euploaeae* has: (i) the second tergite only vaguely punctured, often almost smooth; (ii) hind tibia in dorsal aspect more straight; (iii) hind tarsus rather slender; (iv) female gaster short, not distinctly acuminate posteriorly; (v) antennae stoutish; (vi) funicular segments (2-7) distinctly transverse; (vii) distal funicular segments about one-fifth as broad as long; (viii) clava obliquely truncate and ventral surface in female only half as long as the dorsal surface.

Dr. Boucek sent one female of *B. euploeeae* (identified by himself) to us and in this species (♀) we have noted that there is no tooth on the hind coxa on the inner ventral side unlike that of *B. lasus* Walker which has a distinct tooth on the inner ventral side of the hind coxa in female.

*B. inclinator* Walk. and *B. punctiventris* Cameron are other synonyms of *B. lasus* Walker.

**7. *Brachymeria hearseyi* var. *xanthoterus* Waterston (7: Fig. 1 – 7).**

1837: *Chalcis euploeeae* (Westwood) *Trans. Ent. Soc. Lond.* **11**, p. vi.

1883: *Chalcis euploeeae* Kirby (nec Westwood) *Journ. Linn. Soc. London, Zool.* **17**: 68.

1888: *Chalcis euploeeae* (Cotes) *Ind. Mus. Notes*, **1**: 319.

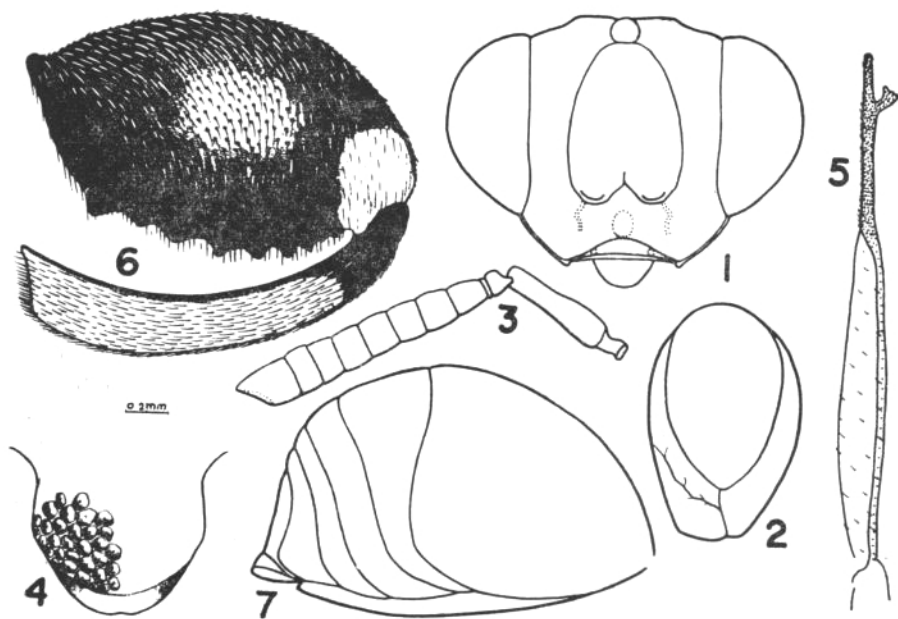
1922: *Chalcis hearseyi* var. *xanthoterus* (Waterston), *Ind. For. Rec.* **9** (2) p. 58.

1925: *Chalcis hearseyi* var. *xanthoterus*, (Waterston), Ramakrishna Ayyar, *Spol. Zeyl.*, **XIII**, p. 238.

*Female*: Length 3.06 – 4 mm. Black; tegulae yellow; coxae, trochanters and femora liver brownish-black except the distal ends of femora which are yellow. Hind tibia yellow with the base liver brownish-black, tarsi yellow. Pubescence silvery and moderately dense. Both mandibles bidentate.

*Head* (Fig. 1) width a little less than that of thorax, slightly over one and one-fourth its length. Vertex distinctly pitted, interspaces between the pits rugulose. Scrobe deep, smooth and shiny. Maximum width of scrobe a little over two-thirds the interocular space, attaining the front ocellus. Length of scrobe a little over one and one-third its maximum width; parascrobal space one-third the maximum width of scrobe. Length of eye (Fig. 1) a little over two times its width; median ocellus a little larger than lateral; the distance between median and lateral ocelli one-third the interocellar distance; interocular space hardly a little less than two and a half times interocellar distance. Width of clypeus a little over four and a half times its median length; width of labrum twice its median length. Width of ocellar area a trifle less than two-thirds the interocular space; interocellar distance a little more than two-times the maximum diameter of the lateral ocellus. Frons without preorbital carinae; postorbital carina present, irregular (Fig. 2). Area below scrobe with a median smooth and

raised portion. Lateral ridges of scrobe very faintly produced in front of the antennal toruli. Inter-antennal projection moderately developed. Height of malar space (Fig. 1) a little over two-fifths the height of eye. Front and hind genal angles as in the Fig. 2. Antenna (Fig. 3) fairly stout, swollen towards apex. Scape not exceeding the front ocellus, longer than segments four to six combined. Pedicel width subequal to its length. Ring segment five times as wide as long. Fourth segment the longest of the funicular segments; fifth shorter than fourth; sixth longer than fifth and equal to seventh; eighth shorter than seventh and subequal to ninth and tenth. Width of flagellar segments gradually increasing from segments four to ten.



7: Figs. 1-7. — *Brachymeria hearseyi* var. *xanthotenus* Waterst. (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, fore wing venation; 6, hind femur and tibia;  
7, abdomen in lateral view.

*Thorax* provided with reticulate, umbilicate and close pits (Fig. 4); interspaces between the pits narrow and rugose. Width of mesoscutum one and two-thirds its length. Width of scutellum subequal to its length. Scutellum high in profile, almost perpendicularly declined towards apex; apical flange explanate and entire (Fig. 4) with moderate pubescence. Fore wing two and three-fifths as long as wide. Margi-

nal vein (Fig. 5) about half the submarginal; postmarginal about one-third the marginal and a little less than twice the stigmal. Hind coxa with its dorsal side smooth, ventral side with distinct deep punctures and with moderate pubescence; without an inner tooth. Hind femur (Fig. 6) a trifle over one and three-fourths as long as wide; outer side with distinct punctures and pubescence; inner side with fewer punctures and pubescence and without a basal tooth; outer ventral margin with a row of 9–13 black teeth.

*Abdomen* (Fig. 7) length subequal to pronotum, mesoscutum and scutellum combined; first tergite smooth and shiny; second tergite shagreened with a single row of indistinct punctures on the baso-dorsal side; sixth tergite with five to seven transverse rows of distinct pits, interspaces of pits faintly rugulose or almost smooth, each row with 12 to 20 pits. Ovipositor sheath slightly visible from dorsal side.

*Specimens examined*: INDIA: Coimbatore, 1 ♀, Coll. No. C. U. 1027 on pin, 20. xii. 1917, T. V. Subramanniam; Bengal, 1 ♀ Coll. No. C. U. 1611 on pin, 23.x.1909, H. M. L. (Full name unknown); North Malabar, Taliparamba, 1 ♀ coll. No. C. U. 1135 on pin from a pupa on piper leaf, 10. ix. 1926, collector unknown; Dehra Dun, Uttar Pradesh, 6 ♀♀, on pins, parasitic on Lepid., 3. i. 1938, J. C. M. Gardner; Coll. Nos. C. U. 1027 to 1055, 1079, 1121 to 1147 from the collections of Faculty of Entomology, Tamilnadu Agricultural University, Coimbatore; Coll. Nos. C. U. 1295 to 1297 from the collections of Forest Research Institute, Dehra Dun; Coll. Nos. C. U. 1609 to 1625 from the collections of Indian Agricultural Research Institute, New Delhi; Coll. No. 1829 to 1843 and 1877 from the collections of Magyar Nemzeti Museum, Budapest.

*Type*: In British Museum.

*Distribution*: India, N. Borneo, Java, Sumatra and Philippines.

*Hosts*: *Hypsiphyla robusta* (Fam. Pyralidae), *Euploea core* (Fam. Nymphalidae), *Psara cynaralis* (Fam. Pyralidae), *Danaïs chrysippus* (Fam. Danaidae).

*Remarks*: This variety can be distinguished from the species *B. hearseyi* Kirby (1883) in having the hind tibia yellow with the base liver brownish-black or black whereas in *B. hearseyi* Kirby the hind tibia is brownish-black to two-thirds from base. Dr. Boucek is of opinion that *B. hearseyi* var. *xanthotenus* is a synonym of *B. euploea* Westwood. The translation of the original description of *B. euploea* given by Westwood (1837) is as follows:—

"*Chalcis (Brachymeria) euploaeae*: black, pubescent; thorax and head punctate; abdomen smooth; tegulae yellow; the two anterior pairs of legs yellow, except the femora, which in the front legs are black at the base, and in the second pair of legs are black with yellow extremities; in the hind legs, the coxa and trochanter are black, the femur is black with yellow on both sides of the extremity; the tibia is yellow except at the base where it is blackish; the tarsi are yellow, and the pulvillus yellow. The posterior femora are each armed on the internal margin with about ten minute teeth".

### 8. *Brachymeria hearseyi* Kirby (8: Figs. 1-7)

1883: *Chalcis hearseyi*, Kirby, *Jour. Linn. Soc. Lond. Zool.*, **17**: 76.

1909: *Chalcis hearseyi* (Kirby), Schmiedeknecht, *Gen. Ins. fas.*, **97** p. 27.

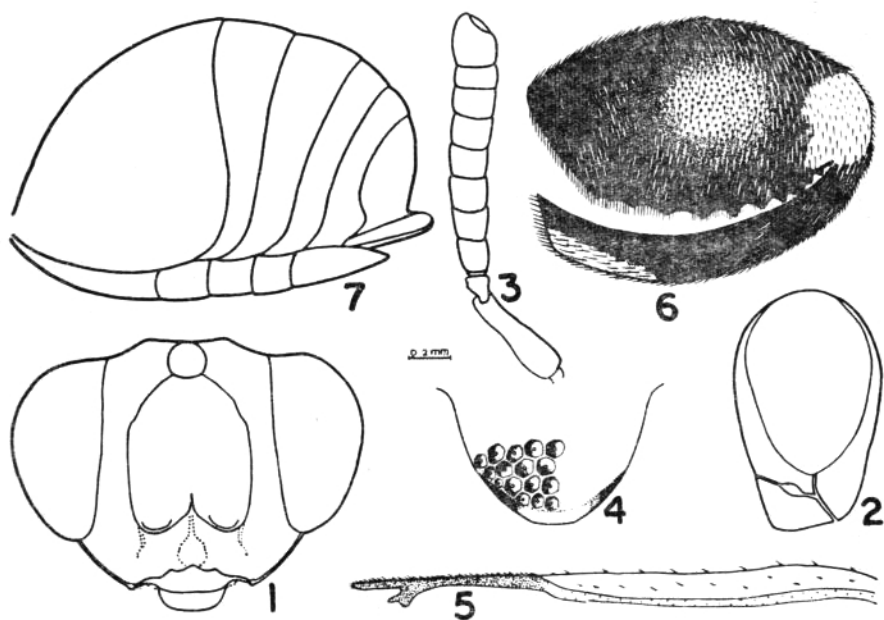
1925: *Chalcis hearseyi* (Kirby), Ramakrishna Ayyar, *Spol. Zeyl.*, **XIII**, p. 238.

*Female*: Length 4.6 mm. Black; tegulae yellow with the basal one-third pale brownish. Fore and mid coxae, trochanters and femora brownish-black except the distal ends of femora which are yellowish. Tibiae and tarsi yellow. Hind coxa black; trochanter brownish-black; femur black with the distal tip yellow; tibia brownish-black with yellowish colouration at the distal end as in figure; tarsus yellow; claw black. Wings hyaline, with brown veins. Pubescence silvery and moderately dense. Both mandibles bidentate.

*Head* (Fig. 1) width a trifle less than the width of thorax, a little over one and one-fourth as wide as long; vertex distinctly pitted, interspaces of pits regulose. Scrobe deep, smooth and shiny; its maximum width a little less than two-thirds the interocular space and attaining the front ocellus. Length of scrobe one and one-third its maximum width. Parascrobal space about one-fourth the maximum width of scrobe. Length of eye (Fig. 1) a little over two times its width; median ocellus a little larger than lateral; the distance between median and lateral ocelli a little over one-third the interocellar distance; interocular space a little more than two and three-fifths interocellar distance and a little less than three times ocellocular distance. Width of clypeus a little more than four times its median length; width of labrum a little more than three times its median length; width of ocellar area a trifle less than three-fourths interocular space; interocellar distance a little more than two times the maximum diameter of lateral ocellus. Frons without preorbital carinae;



postorbital carinae present and as in figure, reaching the genotemporal margin. Area below scrobe with a median smooth raised portion. Lateral ridges of scrobe very faintly produced in front of the antennal toruli. Inter-antennal projection moderate. Height of malar space (Fig. 1) a little over two-fifths the height of eye. Front genal angle slightly acute; hind genal angle (Fig. 2) nearly rectangular. Antenna (Fig. 3) fairly stout, swollen towards apex; scape not exceeding the front ocellus, longer than the segments four to six combined; pedicel width subequal to its length; ring segment a little over four times as wide as long; width of funicular segments gradually increasing from segment four to club.



8: Figs. 1-7. — *Brachymeria hearseyi* Kirby (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, fore wing venation; 6, hind femur and tibia;  
7, abdomen in lateral view.

*Thorax* provided with reticulate, umbilicate and close pits (Fig. 4); interspaces of pits narrow and rugulose. Width of mesoscutum a little less than one and four-fifths its length; scutellum with width subequal to its length, high in profile, almost perpendicularly declined towards apex, its apical part explanate and entire and provided with moderate pubescence. Fore wing a little more than two and three-fifths as long as its width; marginal vein (Fig. 5) about half the

submarginal; postmarginal about one-third the marginal and a little less than twice the stigmal. Hind coxa with its dorsal side smooth, ventral side with distinct deep punctures and moderate pubescence, without an inner tooth. Hind femur (Fig. 6) a little over one and two-thirds as long as wide; its outer side with distinct punctures and pubescence; inner side with fewer punctures and pubescence, and without a tooth; outer ventral margin with a row of 9 to 12 black teeth.

*Abdomen* (Fig. 7) length subequal to pronotum, mesoscutum and scutellum combined. First tergite smooth and shiny. Second tergite shagreened with a single row of punctures on the baso-dorsal side; its sides with punctures and setae. Sixth tergite with four transverse rows of distinct pits, interspaces of pits rugulose, each row with 10 to 15 pits. Ovipositor sheath slightly visible from dorsal side.

*Specimens examined*: 2 ♀♀, Coll. No. C. U. 1956 and Coll. No. C. U. 1950, INDIA: Tanjore, Coll. M. S. Mani on 22. xi. 1931, from pupa of Nymphalid. Coll. Nos. C. U. 1650 to 1663 from the collections of Indian Agricultural Research Institute, New Delhi.

*Types*: Holotype present in the British Museum (Natural History), London and paratypes in the collections of the Forest Research Institute, Dehra Dun.

*Distribution*: India.

*Hosts*: Pupae of Nymphalidae.

*Remarks*: *B. euploaeae* Westw. seems to be related to *B. hearseyi* Kirby very closely and differs from it only in the colouration of hind tibia. In *B. euploaeae* the hind tibia is yellow with the base liver brownish-black or black. Dr. Boucek is of opinion that *B. hearseyi* var. *xanthotenus* Waterston is synonymous with *B. euploaeae* Westwood. Under the circumstances, it is reasonable to designate *B. hearseyi* Kirby as a subspecies of *B. euploaeae* Westwood.

### 9. *Brachymeria intermedia* (Nees), (9: Figs. 1–6)

1834: *Chalcis intermedia*, Nees, *Hym Ichn. affin. Monogr.*, v. 2, p. 29.

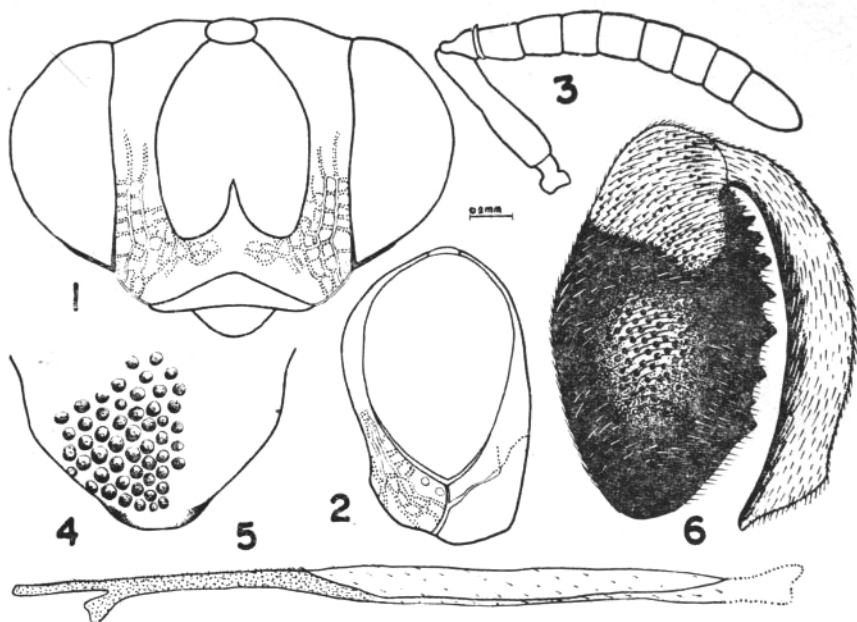
1898: *Chalcis intermedia* (Nees), Dalla Torre, *Cat. Hym.* 5, p. 389.

1910: *Chalcis flavipes*, not Fabricius, not Panzer, Crawford, *Tech. Ser. 19. U. S. Dept. Agr., Bur. Ent.*, p. 18 (mis-determined).

- 1911 : *Chalcis flavipes*, Howard and Fiske, *Bull. 91 U. S. Dept. Agr. Ent.*, P. 240.
- 1916 : *Chalcis flavipes*, Masi. *Ann. Mus. Civ. Stor. Nat. Genova*, Ser. 3, **7**: 78.
- 1929 : *Brachymeria intermedia* (Nees), Burges and Crossman, *Tech. Bull. 86, U. S. Dept. Agr.* p. 116.
- 1935 : *Brachymeria intermedia* (Nees), Dowden, *Jour. Agr. Res.*, **50**: 497.
- 1936 : *Brachymeria intermedia* (Nees), Schedl. *Monog. Angew. Ent.* **12**: 169 – 170.
- 1951 : *Brachymeria intermedia* (Nees), Boucek *Acta Ent. Mus. Nat. Prag*; **27** (Supp. 1): 22. •
- 1954 : *Brachymeria intermedia* (Nees), Thompson, *Cat. Parasites Predators*, Sect. 2, pt. 3, pp. 197 – 8.
- 1959 : *Brachymeria intermedia* (Nees), Steffan, *Cahiers des Nat.*, n. s., **15**: 38
- 1960 : *Brachymeria intermedia* (Nees), Burks, *Ent. News*, **71**: 62.
- 1960 : *Brachymeria intermedia* (Nees), Burks, *Tans. American Ent. Soc.* **LXXXVI**, pp. 249 – 250.

*Female*: Length 5.26 to 5.83 mm. Black; tegulae yellowish with the basal one-fifth brownish-black. Tip of the fore femur and tibia yellow. Tarsi pale brownish-yellow. Mid femur at its tip and tibia yellow. Tarsi pale brownish-yellow. Hind coxa black. Femur black, except the distal end of which about one-third is yellowish. Tibia yellow with a blackish ventral carina from base to tip. Tarsi pale brownish-yellow. Pubescence whitish and moderately dense.

*Head* (Fig. 1) hardly a little wider than the maximum width of thorax, a little more than one and one-third as wide as its own length; surface of the head pitted with interspaces of pits carinate. Scrobe deep, smooth and shiny, occupying a little more than three-fourths the width of interocular space, attaining the front ocellus. Parascrobal space a little more than one-fourth as wide as the width of scrobe. Length of eye two and one-third times its width; median and lateral ocelli of equal diameter. The distance between median and lateral ocelli a little less than half the interocellar distance; interocular space two and two-thirds interocellar distance; interocellar distance two and a half times ocellocular distance. Width of clypeus a little less than five times its median length; width of labrum about two and



9: Figs. 1 - 6. - *Brachymeria intermedia* (Nees) (♀)

1, head in front view; 2, head in lateral view; 3, antenna;

4, scutellum in dorsal view; 5, fore wing venation; 6, hind femur and tibia.

one-fourth its median length; width of ocellar area a little less than three-fourths interocular space; interocellar distance two and a half times as wide as the maximum diameter of the lateral ocellus. Frons with irregular preorbital carina (Fig. 1); postorbital carina present and does not quite reach the genotemporal margin (Fig. 2); pits on the frons irregular and deep. Area below scrobe smooth with sparse punctures. Inter-antennal projection moderate, lateral ridges of scrobe produced in front of the antennal toruli; height of malar space (Fig. 1) a little more than one-fifth the height of eye. Front genal angle slightly acute and hind genal angle almost rectangular. Antenna (Fig. 3) stout. Scape not exceeding the front ocellus, longer than the length of segments four to six combined, contracted after the middle. Pedicel a little longer than wide. Ring segment a little over six times as wide as long. Fourth segment a little longer than wide and shorter than fifth. Fourth, eighth and tenth segments of equal length; fifth and seventh of equal length; sixth and ninth of equal length and shorter than fourth segment; segments four to ten slightly increasing in width. Club a little less

than twice the length of tenth segment and a little less than one and three-fourths its own width.

*Thorax* provided with rounded and umbilicate pits; interspaces of pits smooth and narrow on the mesoscutum. Pits on the scapulae are smaller and the interspaces of pits are half as broad as the diameter of pits. On the scutellum (Fig. 4) in the median portions, the interspaces of pits are half as broad as the pits; mesoscutum one and a half times as wide as long; scutellum a little over one and a half times as wide as long, high in lateral view, gently declined posteriorly, its apical margin explanate and entire with moderate whitish pubescence. Fore wing a little less than two and three-fourths as long as wide; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane. Marginal vein (Fig. 5) about three-fourths the submarginal vein; postmarginal a little over one-third the marginal and two and one-third times the stigmal. Hind coxa distinctly and deeply punctate and moderately pubescent on ventral side with a tooth on the inner side; its dorsal side smooth. Hind femur (Fig. 6) a little more than one and a half times as long as wide; its outer side with distinct, deep punctures and pubescence, its outer ventral margin with a row of eleven teeth, teeth 1 and 3-6 large, 7 and 8 smaller, 2 and 9 still smaller, 10 and 11 smallest. Hind tibia almost equal to the length of hind femur.

*Abdomen* not pointed at apex, distinctly longer than the length of pronotum, mesoscutum and scutellum combined; a little over three-fifths as long as its height. First tergite smooth except in the lateral regions where there are a few punctures and sparse pubescence; its baso-dorsal and baso-lateral regions provided with fine microsculptures. Sixth tergite pitted all over with about twenty longitudinal, deep, close pits with three to ten pits in each row. Ovipositor sheath visible in dorsal view.

*Male*: Differs from female in having the following characters: (i) length about 4.83 mm; (ii) there is no smooth area in the anterior mid-dorsal region on second tergite which is, on the other hand, provided with deep scattered pits on the anterior half with pubescence on the lateral sides; rest of the baso-dorsal and baso-lateral regions of second tergite with fine microsculptures; (iii) there is no tooth on the hind coxa in male.

*Specimens examined*: 1 ♀ Coll. No. 255, on pin, its antenna and fore wing on slide No. 255a, hind leg on slide No. 255b; 1 ♂, Coll. No. 258 on pin; 1 ♀, Coll. No. 257 on pin. INDIA: Srinagar, Kashmir state, Coll. M. K. Zutshi, on vii. 1964 from *Porthetria* pupa.

(From the collections of Commonwealth Institute of Biological Control, Bangalore).

*Types*. According to Burks (1960) the types are probably lost. Plesiotype (No. 255) deposited in the collections of the Commonwealth Institute of Biological Control, Bangalore, India.

*Distribution*: India, Europe, Mediterranean region, Middle East including Iraq and Iran, North & South America.

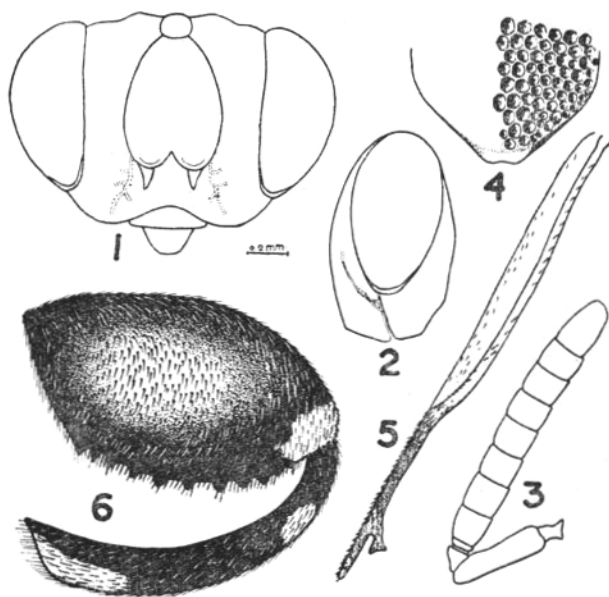
*Hosts*: According to Burks (1960) this is a primary parasite of the pupae of at least 10 families of Lepidoptera. It will, under exceptional circumstances, also parasitise muscoid puparia.

*Affinities*: *B. nursei* (Cameron) resembles *B. intermedia* (Nees) but differs from it in having no tooth on the hind coxa in female and the postorbital carina reaches the genotemporal margin.

# 10. *Brachymeria intermedia porthetrialis* Joseph *et al.*

(10: Figs. 1–6)

*Female*: Length 3.77–4.52 mm. Black; tegulae yellow. Fore coxa, trochanter and femur brownish-black except the distal tip of femur which is yellowish; tibia yellowish with a brownish-black



10: Figs. 1–6. — *Brachymeria intermedia porthetrialis* Joseph *et al.* (♀)

1, head in front view; 2, head in lateral view; 3, antenna; 4, scutellum in dorsal view; 5, fore wing venation; 6, hind femur and tibia.

colouration on the outer, inner and ventral sides. Mid coxa, trochanter and femur brownish-black except the distal tip of femur where it is yellowish; tibia yellowish with a brownish-black colouration in the middle on outer, inner and ventral aspects. Hind coxa, trochanter and femur brownish-black except the distal tip of femur where it is yellowish; tibia brownish-black with a yellowish patch subbasally and apically. Pubescence moderate and white.

*Head* (Fig. 1) width a little less than that of thorax, about one and one-third as wide as long; surface of head with rounded, reticulate and close pits with the interspaces of pits rugose. Surface of scrobe smooth and shiny except on the sides where it is rugulose; scrobe deep, occupying a little over half the interocular space, attaining the front ocellus. Length of scrobe one and two-fifths its width; parascrobal space two-fifths the width of scrobe. Facial area fairly rugose and irregularly carinate. There is no distinct smooth area below the scrobe and the area is evenly rugose. Length of eye (Fig. 1) about two times its width; size of median ocellus equal to that of lateral ocellus; the distance between median and lateral ocelli about half the interocellar distance; interocular space two and four-fifths the interocellar distance. Width of clypeus a little over four times its median length. Width of labrum twice its median length. Width of ocellar area a little over two-thirds the interocular space; interocellar distance twice the maximum diameter of the lateral ocellus. Frons with very faint preorbital carina (Fig. 1). Postorbital carina well developed, branched and not reaching the genotemporal margin but running upwards as in figure (Fig. 2). Inter-antennal projection short. Lateral ridges of scrobe produced in front of antennal toruli (Fig. 1). Height of malar space two times the height of eye (Fig. 1). Front genal angle acute; hind genal angle obtuse and rounded. Antenna (Fig. 3) stout; scape not exceeding the front ocellus, hardly a little longer than the length of segments four to six combined, contracted after the middle; pedicel longer than wide; ring segment four times as wide as long; segment four hardly a little wider than long; segment five a little longer than segment four; segments six and seven of equal length; segments eight and nine almost of equal length and both hardly a little shorter than segment seven; segment ten shorter than ninth; segments five, six, seven and ten of equal width; segment eight a little wider than segment seven and hardly a little shorter than segment nine; club twice as long as the length of tenth segment, about one and two-thirds as long as its own width.

*Thorax* provided with reticulate, rounded and close pits (Fig. 4); interspaces of pits narrow and rugose; mesoscutum about one and

four-fifths as wide as long; notaulices distinct; scutellum a little wider than long, moderately high in lateral view, gently declined posteriorly, apical margin explanate and weakly emarginate with moderate pubescence. Fore wing two and a half times as long as wide; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane; marginal vein (Fig. 5) a little less than half the submarginal; postmarginal a little over one-third the marginal and equal to twice the stigmal. Hind coxa with a coxal tubercle on the inner side, outer side with close punctures and pubescence; hind femur (Fig. 6) about one and four-fifths as long as wide, outer side with close punctures and moderate pubescence; ventral margin with a row of 10–12 black teeth; teeth 1–3 of almost equal size, 4–8 widely spaced. Hind tibia longer than hind femur.

*Abdomen* short and rounded, shorter than the length of pronotum, mesoscutum and scutellum combined, highest after the middle, one and one-third its height; first tergite shiny and faintly shagreened; second tergite with punctures and pubescence on the baso-lateral regions, rest of the portions finely shagreened; sixth tergite with fourteen to sixteen longitudinal rows of pits, each row with eight to nine pits and pubescence.

*Holotype* ♀, Coll. No. 262 on pin, its antenna and fore wing on slide No. 262a and hind leg on slide No. 262b. *Paratypes*: four females. Coll. No. 260 on pin, its antenna and fore wing on slide No. 260a and its hind leg on slide No. 260b. Coll. No. 259 on pin, its antenna and fore wing on slide No. 259a and hind leg on slide No. 259b. Coll. No. 263, 261 and 265 on pins. INDIA: Mysore State, Bangalore, Coll. V. P. Rao (Coll. No. 262) and M. N. Shivalingappa (Coll. Nos. 260, 259, 263, 261), from pupa of *Porthetria* sp. on *Ficus religiosa* in November 1962. Holotype and one paratype (No. 261) deposited in British Museum (Natural History), London, one paratype (No. 265) deposited in U. S. National Museum, Washington. The other paratypes deposited in the Commonwealth Institute of Biological Control, Bangalore.

*Specimens examined*: Coll. Nos. C.U. 1162 to 1178 from the collections of The Faculty of Entomology, Tamilnadu Agricultural University, Coimbatore.

*Distribution*: India, Tailand & Java.

*Hosts*: *Porthetria* sp. (Fam. Lymantriidae) on *Ficus religiosa*.

*Remarks*: *B. intermedia* (Nees) can be separated from this new subspecies in having: (i) the hind tibia yellow; (ii) interspaces of the



punctures on the thorax smooth; (iii) abdomen in female longer than the length of pronotum, mesoscutum and scutellum combined.

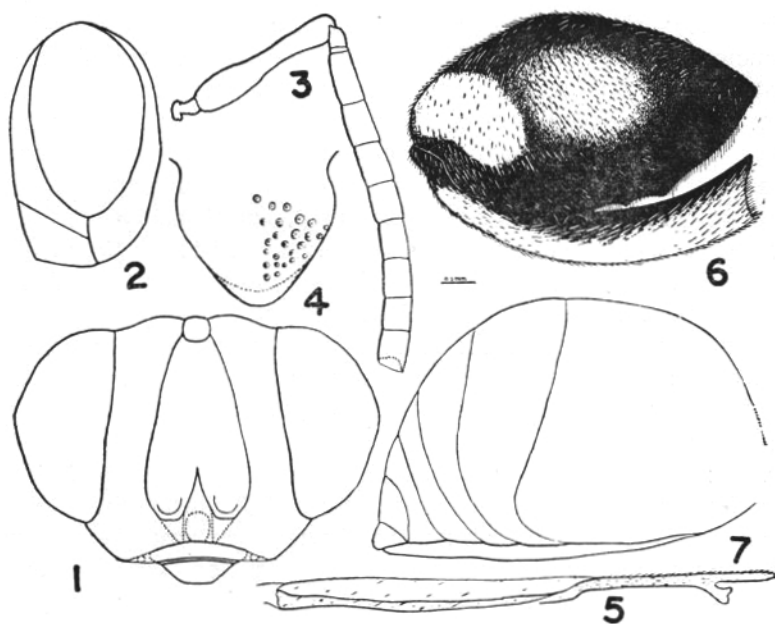
We have earlier described this subspecies as a new species *B. porthetrialis* but later placed it as a new subspecies of *B. intermedia* (Nees).

**11. *Brachymeria nursei* Cameron (11: Figs. 1-7)**

1907: *Onchochalcis nursei* Cameron, *Jour. Bombay Nat. Hist. Soc.* **XVII**, p. 580.

1925: *Onchochalcis nursei* Ramakrishna Ayyar, *Spol. Zeyl.* **XII**, p. 238.

*Female*: Length 4.26—5.11 mm. Black; tegulae whitish-yellow. Fore and mid coxae black; trochanters and femora brownish-black except the distal ends of femur which are whitish-yellow; tibia whitish-yellow with pale brownish colouration medially on the inner side; tarsi brownish-yellow with the tip brownish. Hind coxa, trochanter and femur black, except the distal end of femur which is whitish-



11 : Figs. 1 - 7. — *Brachymeria nursei* Cameron (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, fore wing venation; 6, hind femur and tibia;  
7, abdomen in lateral view.

yellow; tibia yellow with the base brownish-black. This brownish-black colouration extends to the distal end along the ventral margin. Tarsus dark-brownish. The temples, sides of face, apex of scutellum and the metapleurae densely covered with long silvery pubescence. Flagellum opaque, covered with whitish pubescence.

*Head* (Fig. 1) wider than thorax, more than one and one-fourth its length; surface of head with distinct rounded pits and interspaces of pits rugose. Scrobe deep, smooth and shiny; the maximum width of scrobe about three-fourths the interocular space at the level of lateral ocelli, attaining the front ocellus; length of scrobe about one and three-fourths its maximum width; parascrobal space a little less than half the width of scrobe. Length of eye hardly a little over two times its median length (Fig. 1). Median ocellus larger than lateral; the distance between median and lateral ocelli a little over one-third the interocellar distance; interocular space a little less than two and three-fourths the interocellar distance; interocellar distance a little less than four times the ocellocular distance. Width of clypeus a little more than six times its median length; width of labrum three times its median length; width of ocellar area about three-fourths the interocular space; interocellar distance a little over two times the maximum diameter of the lateral ocellus. Frons without preorbital carina; postorbital carina present and reaching the genotemporal margin (Fig. 2); area below scrobe with a broad, shiny, raised, smooth plate; lateral ridges of scrobe not produced in front of the antennal toruli; small smooth glabrous areas present below the antennal sclerites; basal half of mandibles closely punctured, apical part smooth and brown; inter-antennal projection moderately long; height of malar space (Fig. 1) about one-third the height of eye; front genal angle slightly acute; hind genal angle slightly obtuse and almost rectangular. Antenna (Fig. 3) not stout; scape not exceeding the front ocellus, longer than the combined length of segments four to six, well dilated before base; pedicel a little longer than wide; ring segment three times as wide as long; fourth segment a little over two times as long as wide; fifth and sixth segments almost of equal length and shorter than fourth; seventh shorter than sixth; eighth shorter than seventh and equal in length to ninth; tenth shorter than ninth, a little more than half the club; width slightly increasing from segment four to seven; seven to ten almost of equal width.

*Thorax* with small, round pits (Fig. 4). On the pronotum and on the anterior part of the mesoscutum the pits are close; in rest of the portions of the mesoscutum, scapulae and scutellum, the interspaces are broad, sometimes broader than the diameter of the pits; interspaces

of pits smooth and shiny on the mesoscutum, scapulae and scutellum, rugose on pronotum. Mesoscutum a little over one and a half times as wide as long; scutellum (Fig. 4) wider than long, moderately high in lateral view, gently declined posteriorly, apical margin explanate and rounded off (Fig. 4). Fore wing a little less than three times as long as wide; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane; marginal vein (Fig. 5) a little less than half the submarginal, a little less than three times the stigmal. Hind coxa on outer side with punctures and pubescence; interspaces of punctures broad, smooth and shiny. Inner side of hind coxa with fewer punctures and pubescence. Hind femur (Fig. 6) about one and three-fourths as long as wide, with distinct shallow punctures and pubescence on its outer side; inner side with fewer punctures and pubescence and without an inner basal tooth. Outer ventral margin with a row of 10 to 11 black teeth (Fig. 6).

*Abdomen* (Fig. 7) a little longer than the combined length of pronotum, mesoscutum and scutellum, a little over one and a half times its own height; first tergite smooth and shiny except on the sides where there are punctures and pubescence; second tergite with distinct punctures on the baso-dorsal and lateral areas; lateral sides with pubescence; rest of the dorso-median and distal portions with fine microsculptures; sixth tergite with about 9 transverse rows of pits, each row with several pits, the pits often being indistinct because of pubescence. Ovipositor sheath slightly or not visible from above.

*Male*: Length 4.32 mm. Resembles the female in all respects except that the length of the abdomen is equal to the length of the thorax in the male; sixth tergite with about seven or eight transverse rows of pits, each row with several pits.

*Specimens examined*: 1 ♀, Coll. No. C. U. 1013 on pin, its antenna and fore wing on slide No. 1013a and hind leg on slide No. 1013b, INDIA: Coimbatore, Coll. C. K. S. (Full name unknown) on 15. xii. 1939 from *Simplica robustalis*; 1 ♂, Coll. No. C. U. 1018 on pin, INDIA: Tindivanam, Coll. M. Basheer on 4. iii. 1941 from pupa on Groundnut; four ♀♀ on pins, Coll. No. C. U. 1014, 1016, 1017, INDIA: Tindivanam, on pupa on Groundnut Coll. M. Basheer; Coll. No. 1015, INDIA: Coimbatore, Coll. C. K. S. from *Simplica robustalis*.

*Types*: Holotype present in the British Museum (Natural History), London and paratype in the collections of the Forest Research Institute, Dehra Dun. Plesiotypes are with the Entomology Division, Tamilnadu Agricultural University, Coimbatore.

*Distribution*: India.

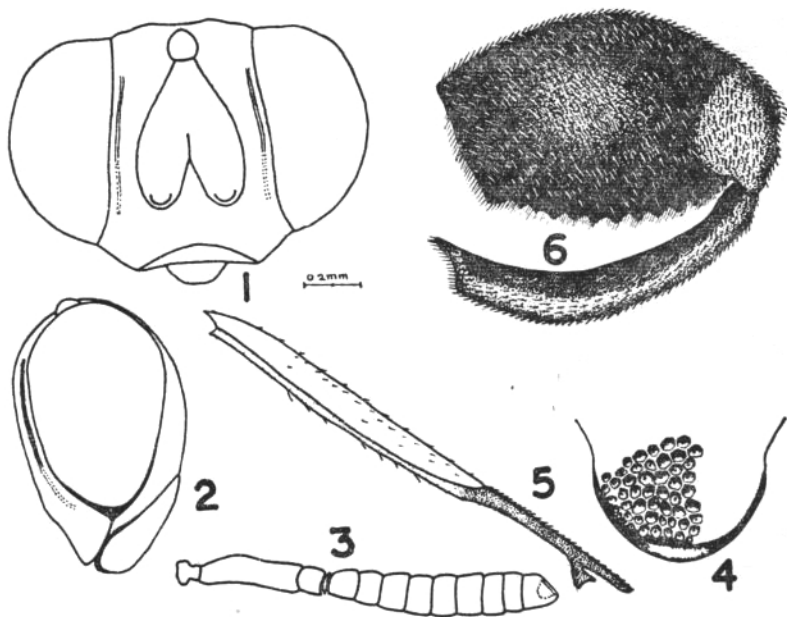
*Host*: *Simplica robustalis* G. (Fam. Noctuidae) on Cholam.

*Affinities*: *Brachymeria intermedia* (Nees) seems to be allied to *B. nursei* Cameron on account of the following features: (i) colouration almost similar; (ii) apex of scutellum not bidentate; (iii) punctures on scutellum not close; (iv) area below scrobe with median raised smooth portion. But *B. intermedia* (Nees) can be distinguished from *B. nursei* Cameron in having the following characters: (i) there is a tooth on the hind coxa of female in *B. intermedia* (Nees); (ii) lateral ridges of scrobe not produced in front of the antennal toruli in *B. nursei* Cameron; (iii) postorbital carina does not reach the genotemporal margin in *B. intermedia* (Nees).

**12. *Brachymeria koduvalliensis* Joseph *et al.* (12: Figs. 1–6)**

1970: *Brachymeria koduvalliensis* Joseph *et al.* *Agri. Res. J. Kerala*, **8** (1): 24–25.

*Female*: Length 3.58 mm. Black; tegulae yellowish with blackish brown basal margin. Fore legs with coxae and trochanters black; femora black except at the distal two-fifths which is immaculate



12: Figs. 1–6. — *Brachymeria koduvalliensis* Joseph *et al.* (♀)

1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, fore wing venation; 6, hind femur and tibia.

yellow; tibiae immaculate yellow and tarsi yellowish. Mid leg similar in colouration to that of fore leg except that the yellowish colouration of the femur is reduced to one-fifth of its distal region. Hind leg with coxae and trochanters black; femora black except for one-fourth of its portion at its tip which is yellowish; tibiae yellowish except the area along the ventral carina which is blackish; tarsi dull yellowish. Pubescence whitish and moderate.

*Head* (Fig. 1) a little wider than the width of thorax, a little less than one and a half times as wide as long. Surface of head with large reticulate and close pits; the interspaces of the pits rugose. Scrobe somewhat smooth, length about one and one-third its own width. Parascrobal space a little over one-fourth the width of the scrobe. Scrobe moderately deep, occupying two-thirds the interocular space, attaining the front ocellus. Length of eye twice its width. Median ocellus only slightly larger than lateral ocellus. The distance between median and lateral ocelli distinctly less than half the interocellar distance. Interocular space twice the interocellar distance. Width of clypeus a little over four times its length. Width of labrum two and two-fifths its length. Width of ocellar area a little less than the interocular space. Interocellar distance distinctly more than twice the maximum diameter of lateral ocellus. Frons with preorbital carina becoming less distinct near the malar ridge (Fig. 1); postorbital carina present and joins the genotemporal margin (Fig. 2). Inter-antennal projection long, almost reaching the middle of the scrobe. Lateral ridges of scrobe not produced in front of the antennal toruli. Height of malar space about one-fifth the height of eye. Front genal angle slightly acute; hind genal angle slightly obtuse and rounded. Antenna (Fig. 3) fairly stout, increasing in thickness from segments four to ten. Scape not exceeding the front ocellus, a little shorter than the length of segments four to six combined, contracted after the middle. Pedicel as long as wide. Ring segment about three times as wide as long; segments four to ten becoming wider; segments four to eight of equal length; segment nine a little longer than eight; segment ten shorter than segment nine; club a little over thrice the length of segment ten, a little less than one and three-fourths as long as its own width.

*Thorax* (Fig. 4): The whole of the surface of the pronotum, mesoscutum, scapulae and scutellum provided with moderately sized, umbilicate, reticulate, rounded and close pits, with a seta arising from each pit; the interspaces of pits rugose and narrow. Mesoscutum a little more than one and two-thirds as wide as its length; notaulices distinct. Scutellum one and one-fifth as wide as long, high in lateral

view, gently declined posteriorly, its apical margin slightly explanate and rounded off with close pubescence. Fore wing about two and two-thirds as long as wide; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane. Marginal vein (Fig. 5) slightly less than half the submarginal; postmarginal a little over one-third the marginal and a little over thrice the stigmal. The outer side of the hind coxa with large, close punctures and pubescence. Hind femur (Fig. 6) about one and three-fifths as long as wide; its outer side with close punctures and pubescence; its inner basal region without tooth; ventral basal margin with a row of fourteen teeth as in figure; the first tooth being largest; second, third, thirteenth and fourteenth small; fourth to twelfth large. Hind tibia hardly a little longer than hind femur.

*Abdomen* a little longer than the length of pronotum, mesoscutum and scutellum combined; highest in the middle; length one and one-third its height. First tergite large and extending to half of the abdomen, surface shiny and shagreened; second tergite with micro-sculptures and moderate pubescence; sixth tergite with seven rows of punctures, each row with about ten pits and close pubescence.

*Holotype*: Coll. No. 176 ♀ on pin, its antenna, fore wing and hind leg on slide 28a, 28b & 28c respectively. INDIA: Calicut, Koduvally. Coll. Joseph 31. v. 1968. Type will be deposited in Indian Agricultural Research Institute, New Delhi.

*Specimens examined*: Coll. No. C. U. 650 from the collections of Bishop Museum, Honolulu. Coll. No. C. U. 267 from the collections of Commonwealth Institute of Biological Control, Bangalore. Coll. Nos. C. U. 232 & 233 from the collections of University of Agricultural Sciences, Bangalore.

*Distribution*: India and Philippines.

*Host*: *Microplitis maculipennis* (Fam. Braconidae)

*Affinities*: This species resembles *Brachymeria nursei* Cameron in the following characters:— (i) Colouration of legs; (ii) presence of silvery-white pubescence on the sides of the face and apex of the scutellum; (iii) basal half of mandibles closely punctured. But it differs from *B. nursei* Cameron in the following characters:— (i) Preorbital carina present; (ii) clypeus not depressed; (iii) thoracic punctures closely set.

This species also resembles *Brachymeria intermedia* Nees in many characters but differs from it in the following:— (i) Hind coxa without tooth; (ii) Scutellum not bidentate; (iii) preorbital carina

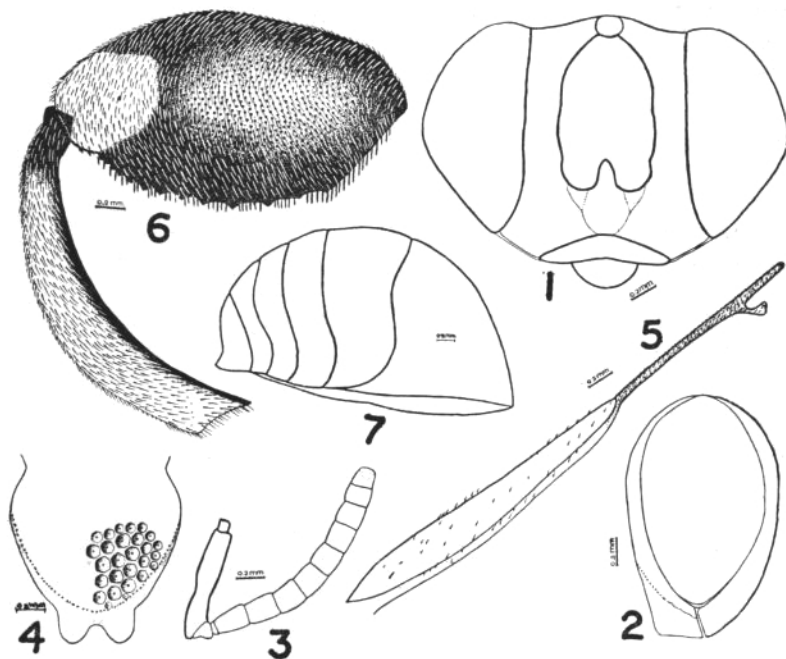
present; (iv) postorbital carina more prominent and reaches the genotemporal margin.

*Remarks:* *B. wittei* (Schmitz) is a very variable species and some of its forms resemble *B. koduvalliensis*.

**13. *Brachymeria gigantea* Joseph et al. (13: Figs. 1-7)**

1972: *Brachymeria gigantea* Joseph et al., *Oriental Ins.*, **6** (1): 48-50

*Female:* Length 7.24 mm. Black; tegulae brownish-yellow with the basal margin blackish-brown. Fore coxa and trochanter black; femur black except the apex which is yellow; tibia yellow with a pale brownish colouration on the inner ventral side in the middle. Mid coxa and trochanter black; femur black except at the apex where it is yellow; tibia yellow with a pale brownish colouration on the inner ventral side at middle. Hind coxa, trochanter and femur black, except the apex of femur where it is yellow; tibia yellow except at the base



13: Figs. 1-7. — *Brachymeria gigantea* Joseph et al. (♀)

1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, fore wing venation; 6, hind femur and tibia;  
7, abdomen in lateral view.

where it is black, this blackish colouration extending to the ventral carina (Fig. 6). Pubescence dirty-white and dense.

*Head* (Fig. 1) width a little less than that of thorax, a little more than one and one-third as wide as its own length; surface of head with reticulate shallow pits; interspaces of pits rugose. Scrobe deep, smooth and shiny, its maximum width occupying over three-fourths the interocular space, reaching the front ocellus. Length of scrobe a little over one and a half times its maximum width; parascrobal space hardly a little over one-third the width of scrobe. Length of eye (Fig. 1) a little more than twice its width; median ocellus equal in size to the lateral ocellus; the distance between median and lateral ocelli hardly a little more than three-fifths the interocellar distance; interocular space two and a half times the interocellar distance; interocellar distance a little less than three times ocellocular distance. Width of clypeus about six times its median length; width of labrum hardly a little more than two times its median length; width of ocellar area three-fourths the interocular space; interocellar distance about twice the maximum diameter of the lateral ocellus. Frons without preorbital carinae; postorbital carina present (Fig. 2) and becomes obsolescent before reaching the genotemporal margin. Inter-antennal projection moderately developed. Lateral ridges of scrobe produced in front of the antennal toruli (Fig. 1); area below scrobe not smooth but with punctures; height of malar space (Fig. 1) about one-fourth the height of eye; front genal angle (Fig. 2) slightly acute; hind genal angle slightly obtuse. Antenna (Fig. 3) rather slender; scape not exceeding the front ocellus, distinctly longer than the segments four to six combined, slightly contracted after the middle; pedicel length about one and one-third as long as thick; ring-segment length about one-fourth its width; fourth segment longer than any other funicular segments; fifth slightly shorter than the fourth segment; sixth and seventh equal; eighth and ninth subequal and shorter than segments six and seven; tenth shorter than ninth; segments four to six slightly increasing in thickness; segments seven to ten subequal; club hardly a little more than twice the tenth segment and a little more than twice its own width.

*Thorax* (Fig. 4) provided with reticulate, rounded, umbilicate and close pits, interspaces of pits narrow and rugose; mesoscutum about one and two-fifths as wide as long; scutellum about one and one-fifth as long as wide, high in profile, strongly, almost perpendicularly declined posteriorly, apical margin widely explanate, deeply emarginate and bilobed with dense pubescence. Fore wing about two and one-fourth times as long as its greatest width, pubescence sparse



in the basal one-fourth and close in the rest of the wing membrane; marginal vein (Fig. 5) distinctly more than half of the submarginal; postmarginal a little more than one-fourth the marginal and a little more than twice the stigmal. Hind coxa on outer side with distinct punctures and pubescence, its inner side smooth with sparse pubescence. Hind femur (Fig. 6) a little more than one and three-fourths as long as wide; its outer side with distinct punctures and pubescence; inner side without a tooth and with fewer punctures and pubescence; and provided along its outer ventral margin with a row of 13 black teeth (Fig. 6).

*Abdomen* (Fig. 7) distinctly longer than the pronotum, mesoscutum and scutellum combined, highest in the middle; about one and two-thirds as long as its width. First tergite finely shagreened and with a few punctures and pubescence on the latero-distal sides. Second tergite with deep punctures in the basodorsal area except in the middle where there are only very few pits; its lateral sides with deep punctures and pubescence, the remaining areas with fine microsculpture. Sixth tergite with a median narrow longitudinal ridge and bearing 9 to 10 transverse rows of reticulate pits, each row with several pits and interspaces between the pits rugose. Ovipositor sheaths slightly or not visible from above.

*Male*: Length 6.45 mm; the male resembles the female in all features except that the length of its abdomen is almost equal to the thorax. Sixth tergite with seven transverse rows of reticulate pits, each row with several pits and the interspaces between the pits and inside of the pits rugose.

*Holotype* ♀, Coll. No. C. U. 769 on pin, its antenna and fore wing on slide No. 769a and hind leg on slide No. 769b; JAVA, Coll. K. C. Piepers. *Allotype* ♂, Coll. No. C. U. 772 on pin; JAVA, Coll. E. Jacobson on iii. 1904. Types deposited in Rijksmuseum Van Natuurlijke Historie, Leiden.

*Distribution*: Java.

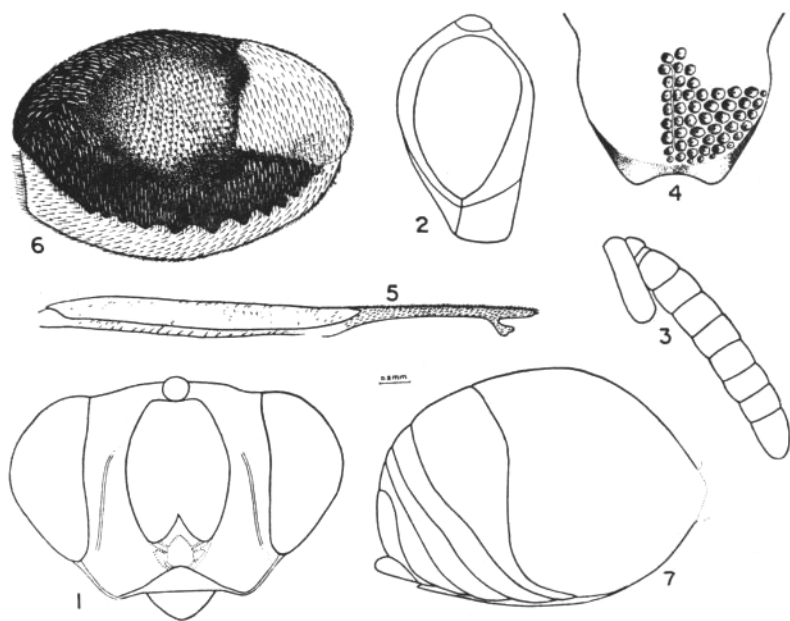
*Hosts*: Unknown.

*Remarks*: This species was wrongly identified as *Brachymeria euploae* Westwood and remained in the Rijksmuseum Van Natuurlijke Historie, Leiden. On close examination it is found to be a new species. It can be distinguished from *B. euploae* Westwood by the following characters: (i) apex of scutellum deeply incised in the middle forming two large lobes (Fig. 4); (ii) presence of a longitudinal ridge on the sixth tergite; (iii) larger size.

**14. *Brachymeria scutellocarinata* Joseph et al. (14: Figs. 1-7)**

1972: *Brachymeria scutellocarinata* Joseph et al., *Oriental Ins.*,  
**6** (1): 45-47

*Female*: Length 4.97 mm. Black; tegulae yellow. Fore coxa and trochanter brownish-black; basal half of femur brownish-black and distal half yellow; tibia yellow; tarsus yellow, except the tip which is brownish. Mid coxa and trochanter brownish-black; femur brownish-black except the distal end which is yellow; tibia yellow; tarsus yellow with the tip brownish. Hind coxa, trochanter and femur black, except the distal end of femur which is yellowish and as in Fig. 6; tibia yellow. Pubescence whitish and moderate.



**14:** Figs. 1 - 7. — *Brachymeria scutellocarinata* Joseph et al. (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
 4, scutellum in dorsal view; 5, fore wing venation;  
 6, hind femur and tibia; 7, abdomen in lateral view.

*Head* (Fig. 1) width distinctly less than that of thorax, a little more than one and one-third as wide as its own length; surface of head distinctly pitted, with the interspaces rugose. Scrobe deep, smooth and shiny, its maximum width a little over three-fourths the interocular space, attaining the front ocellus. Length of scrobe about

one and one-third its maximum width; parascrobal space about one-third the width of scrobe. Length of eye (Fig. 1) a little more than twice its width, median ocellus slightly bigger than lateral; the distance between median and lateral ocelli one-third the interocellar distance; interocellar distance about two and a half times ocellocular distance. Width of clypeus hardly a little more than six times its median length. Width of labrum two and one-third times its median length; width of ocellar area a little less than three-fourths interocular space; interocellar distance about twice the maximum diameter of the lateral ocellus. Frons with distinct preorbital carina which runs upward from the malar ridge and becomes obsolescent as in Fig. 1. Postorbital carina present and reaches the genotemporal margin (Fig. 2). Inter-antennal projection moderately developed. Lateral ridges of scrobe produced in front of antennal toruli (Fig. 1); area below scrobe with a median smooth portion (Fig. 1); height of malar space a little less than one-third the height of eye; front genal angle and hind genal angle nearly rectangular (Fig. 2). Antenna (Fig. 3) stout; scape not exceeding the front ocellus, almost as long as segments four to six combined; pedicel almost as long as wide; ring-segment about four times as wide as long; length of the fourth segment a little less than its width, a little more than the length of fifth segment; the fifth segment a little shorter than the sixth segment; seventh and eighth segments subequal; ninth segment shorter than eighth but a little longer than tenth; segments four to seven slightly increasing in thickness; segments seven to nine almost of equal width; tenth segment slightly more slender than the ninth; club about twice the length of segment ten and about one and three-fourths its own thickness.

*Thorax* provided with large, rounded, reticulate, umbilicate and close pits, interspaces of pits rugose and narrow; scutellum with a median narrow raised ridge as in Fig. 4; mesoscutum one and three-fourths as wide as long. Scutellum almost of equal length and width, high in profile, strongly, almost perpendicularly declined posteriorly; apical margin explanate and widely emarginate with thick, stout pubescence. Fore wing (Fig. 5) a little over two and a half times as long as wide, pubescence sparse in the basal one-fourth and dense in the rest of the wing membrane; marginal vein about half the submarginal vein; postmarginal a little more than one-third the marginal and a little over twice the stigmal. Hind coxa with distinct shallow punctures and pubescence on ventral side; dorsal side smooth and without pubescence. Hind femur (Fig. 6) on outer side provided with deep, close punctures and pubescence; inner side without a basal tooth, smooth with sparse punctures and sparse pubescence;

a little less than one and three-fourths as long as wide and provided on its outer ventral margin with a row of twelve black teeth. Length of hind tibia almost equal to hind femur.

*Abdomen* (Fig. 7) not pointed posteriorly; distinctly shorter than pronotum, mesoscutum and scutellum combined, highest about the middle, hardly a little more than one and one-third as long as wide. First tergite smooth and shiny. Second tergite with punctures on dorso-basal and dorso-lateral areas, except in the middle on dorso-basal area; rest of the portions of the tergite finely shagreened. Sixth tergite moderately pubescent and with nine transverse rows of almost rounded pits, the basal transverse row having about twenty-five pits and the distal transverse row about four pits; the interspaces between the pits rugose. Ovipositor sheaths slightly or not visible from above.

*Male*: Length 4.54 mm. Resembles the female in all features, except that a median smooth area is absent below the scrobe. Sixth tergite moderately pubescent and with six transverse rows of almost rounded pits with the interspaces between the pits rugose; the basal transverse row with about twenty pits and the distal transverse row with about ten pits.

*Holotype* ♀, Coll. No. C. U. 816 on pin, its antenna and fore wing on slide No. 816a, JAVA: Samarang, Coll. E. Jacobson on x. 1909. Allotype ♂, Coll. No. C. U. 542 on pin, its hind leg on slide No. 542, BRITISH N. BORNEO: Taiwan, Coll. T. C. Maa on 9-18. ix. 1958. Types deposited in Rijksmuseum Van Natuurlijke Historie, Leiden.

*Specimens examined*: Coll. No. C. U. 1185 from the collections of Faculty of Entomology, Tamilnadu Agricultural University, Coimbatore. Coll. No. C. U. 170 from the Department of Zoology, University of Calicut.

*Distribution*: Java, British N. Borneo and India.

*Hosts*: Tachinid pupa (Fam. Tachinidae)

*Affinities*: *B. lugubris* Walk. resembles this species in having: (i) the scutellum with a median longitudinal carina; (ii) preorbital and postorbital carinae present; (iii) apex of scutellum emarginate. But it differs from *B. scutellocarinata* in having: (i) the legs almost completely black except that there is a tan spot at the apex of hind femur; (ii) sixth tergite with irregular transverse rows of shallow pits; (iii) nature of preorbital carinae differ.

*B. fiskei* Crawford also resembles *B. scutellocarinata* but differs from it in having the hind tibia yellowish or brownish yellow at base

and apex with the middle portion black or reddish black and the scutellum without a longitudinal carina but with a long narrow unpitted space at middle. *B. fiskei* is comparatively larger species measuring 7–8 mm. (♀).

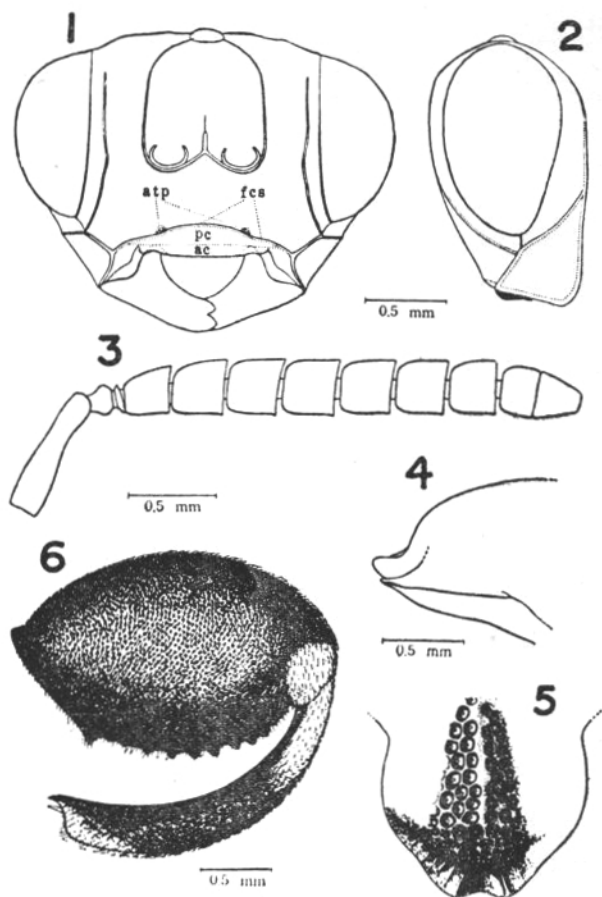
**15. *Brachymeria fiskei* (Crawford) (15: Figs. 1–6)**

- 1910: *Chalcis fiskei* Crawford, *Tech. Ser. U. S. Dept. Agr. Ent.* no. **19**, pt. 2; 14, 16–17, figs. 13, 14.  
 1921: *Chalcis yponomeutae* Okamoto, *Rep. Hokkaido Agr. Exp. Stat.* **12**: 8–9, pl. 5, fig. 12. Syn. nov.  
 1932: *Brachymeria fiskei*, Ishii, *Icon. Ins. Jap.* (first edit.): 384, fig. 676.  
 1937: *Brachymeria fiskei*, Wang, *Ent. and Phytop.* **5**: 161.  
 1938: *Brachymeria fiskei*, Mani, *Cat. Ind. Ins.* pt. **23**: 147.  
 1950: *Brachymeria fiskei*, Ishii, *Icon. Ins. Jap.* (revised edit.): 1406, fig. 4050.  
 1960: *Brachymeria fiskei* (Crawford), Habu, *Bul. Nat. Inst. Agric. Sci.*, No. **11**, p.184-188.  
 1962: *Brachymeria fiskei* (Crawford), Habu, *Fauna Japonica*, p. 48-51.

*Female*: Length 7.0-8.0 mm. Black; tegulae yellow. Coxae and trochanters shiny black; femora nearly black, with apex (and sometimes base of fore and mid femora) yellow or brownish-yellow; fore tibiae yellow, outer side black except yellowish basal and apical parts, inner side somewhat brownish, median part of mid tibiae black, basal and apical portions yellow; hind tibiae (Fig. 6) mostly black or reddish-black, basal and apical parts yellow or brownish-yellow, ventral side wholly black; tarsi yellow or brownish-yellow, claws and arolium reddish-brown (apical part of claws dark). Pubescence and bristles on body silvery-grey or silvery-white.

*Head* (Fig. 1) slightly narrower than thorax, transversely wider in ventro-frontal aspect; surface fairly pitted; pits on genae somewhat shallow, interspaces of pits carinate; surface in scrobe almost smooth but with a few traces of transverse wrinkles at dorsal part; ocellar area two-thirds as wide as interocular space at level of hind ocelli; interocellar distance two and one-fifth to two and one-fourth times as wide as major axis of hind ocelli; frons with distinct, somewhat sinuous preorbital carina on each side; scrobe deep, occupying more than one-half of width of interocular space, reaching front ocellus;

inter-antennal projection narrow; area below scrobe depressed along fronto-clypeal suture; height of malar spaces a little more than one-third as high as compound eyes; postorbital carina distinct, reaching



15: Figs. 1-6. — *Brachymeria fiskei* (Crawford) (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in lateral view; 5, scutellum in dorsal view;  
6, hind femur and tibia.

posterior margin of genotemporal regions; front genal angle weakly acute, hind angle somewhat rounded though nearly rectangular. Antennae (Fig. 3) not stout; scape not exceeding front ocellus, fairly shorter than segments 4 to 6 combined, widest before base; pedicel a little wider than long; segment 4 almost as long as segment 5, as

long as wide, segments 5 to 10 slightly wider than long, not thickened towards apex; club about twice as long as segment 10.

*Thorax* distinctly pitted on dorsal side; interspaces of pits narrow, not carinate (somewhat carinate on pronotum), smooth, without microsculpture (faint microsculpture visible on pronotum and on anterior part of mesoscutum); scutellum (Fig. 5) with rather long narrow unpitted space at middle; mesoscutum one and one-eighth times as wide as long; scutellum (Figs. 4-5) rather low in profile, apex relatively widely explanate, clearly emarginate forming two lobes. Fore wing two and three-fourths as long as wide; marginal vein of fore wing more than two-thirds to three-fourths as long as submarginal; postmarginal one-fifth as long as marginal, twice as long as stigmal. Hind coxae densely and distinctly punctate and pubescent at ventral side, without protuberance on inner ventral side; hind femora (Fig. 6) one and three-fifths to one and two-thirds as long as wide, outer side densely punctate and pubescent, not rugose nor striate but shiny, punctures small, inner side somewhat sparsely punctate and pubescent, inner ventral side with one very obtuse protuberance near base, outer ventral margin with about thirteen teeth.

*Abdomen* ovate, a little longer than the length of pronotum, mesoscutum and scutellum combined, widest a little before middle, one-tenth to one-sixth narrower than thorax. First tergite smooth; second tergite with sparse but distinct punctures at medio-basal area, with minute dense punctures at medio-apical area on dorsal side, densely distinctly pitted and bristled on sides; sixth tergite distinctly pitted and bristled with evident microsculpture. Ovipositor sheath visible from above.

*Male*: Length 4.2-6.5 mm. Legs more yellowish than in ♀; fore tibiae with narrower and shorter black patch at outer side; mid tibiae without black patch but somewhat brownish at inner side, with smaller black patch at outer side; hind tibiae generally more brownish. Antennae with trichoid sensillae on ventral side of funicle; scape relatively short, a little longer than segments 4 to 5 combined. Scutellum with less distinct lobes at apex.

*Specimens examined*: One specimen (Coll. No. C. U. 539) identified by Boucek (1971) as *Brachymeria* near *fiskei* (Crawf.).

*Distribution*: India, Japan and N. Borneo.

*Hosts*: Tachinidae from *Lymantria dispar* Linn. in Japan (after Crawford, 1910; Schedl, 1936); *Crossocosma* and *Tachina* (Tachinidae) parasitic on the gipsy moth, these maggots being attacked before leaving the host, in Japan (after Howard and Fiske, 1911);

Tachinidae (Ishii, 1932, 1950; Shiraki, 1940, 1954). The following are secondary hosts: *Yponomeuta malinella* Zeller; larva of *Mahasena minuscula* Butler; *Naxa seriaria* Motschulsky (after Habu 1960).

*Affinities* : *Brachymeria scutellolocarinata* Joseph *et al.* resembles *Brachymeria fiskei* in many features but differs from it in having: (i) the hind tibia yellow; (ii) the scutellum with a longitudinal carina and without long narrow unpitted space at middle; (iii) comparatively smaller than *B. fiskei*.

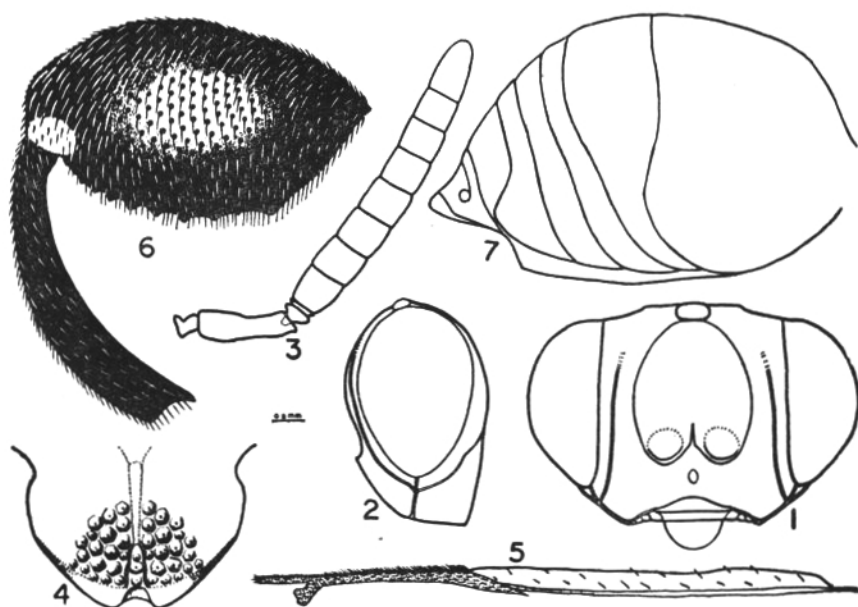
*Remarks* : This is the largest species among Oriental *Brachymeria*.

The above description is based on the account given by Habu (1960).

# 16. *Brachymeria lugubris* Walker (16: Figs. 1 – 7)

1871: *Chalcis lugubris* Walker, *Notes on Chalcididae*, p. 49.

*Female* : Length 5.51 mm. Black; tegulae black. Legs black with the inner side of the fore and mid tibiae blackish-brown and



16: Figs. 1 – 6. — *Brachymeria lugubris* Walk. (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, fore wing venation;  
6, hind femur and tibia; 7, abdomen in lateral view.



with a minute tan spot at the apex of hind femur. Pubescence dense and silvery.

*Head* (Fig. 1) width a little less than that of thorax, about one and two-fifths its own length; vertex with distinct pits, interspaces between the pits and inside of the pits rugose. Scrobe deep, smooth and shiny; the maximum width of scrobe two-thirds the interocular space, attaining the front ocellus. Length of scrobe one and one-fourth its maximum width; parascrobal space a little less than one-third the maximum width of scrobe. Length of eye (Fig. 1) about two and one-third its own width; median ocellus a little larger than lateral; the distance between median and lateral ocelli a little more than one-third the interocellar distance; interocular space about two and four-fifths the interocellar distance; interocellar distance a little over two times the ocellocular distance. Width of clypeus a little less than five times its median length; width of labrum twice its median length; width of ocellar area two-thirds the interocular space; interocellar distance a little over two and one-third the maximum diameter of the lateral ocellus. Frons with distinct preorbital carinae (Fig. 1); post-orbital carinae present (Fig. 2) and reaching the genotemporal margin. Area below scrobe with a very small median smooth portion as in figure 1. Lateral ridges of scrobe not produced (in some cases very faintly produced) in front of the antennal toruli. Inter-antennal projection moderately developed. Height of malar space about one-third (Fig. 1) the length of eye. Front and hind genal angles nearly rectangular and as in figure 2. Antenna (Fig. 3) stout. Scape not reaching the front ocellus, shorter than segments four to six combined, contracted beyond the middle. Pedicel width a little more than its length. Ring segment six times as wide as long. Segments four to eight subequal in size; ninth a little shorter than eighth and a little longer than tenth. Club a little less than one and three-fourths as long as wide.

*Thorax* provided with reticulate, rounded, umbilicate and close pits (Fig. 4); interspaces between the pits narrow and rugose on pronotum and mesoscutum. Interspaces of pits on scutellum not rugose but smooth. Scutellum with a median longitudinal carina (Fig. 4), moderately high in lateral view, gently declined posteriorly; apical margin explanate and emarginate, with dense pubescence. Width of mesoscutum a little less than one and two-thirds its length. Scutellum subequal to its width. Lateral face of pronotum with dorsal margin complete. Fore wing a little more than two and three-fourths as long as wide; marginal vein (Fig. 5) a little over half the submarginal; postmarginal a little over one-fourth the marginal, hardly

a little over twice the stigmal. Hind coxa with dorsal side smooth, ventral side distinctly punctured and pubescent without tooth. Hind femur (Fig. 6) a little over one and three-fourths as long as wide; its outer side with deep punctures and pubescence, inner side with fewer punctures and pubescence and without a basal tooth; outer ventral margin with a row of twelve teeth.

*Abdomen* (Fig. 7) length subequal to pronotum. mesoscutum and scutellum combined, a little less than one and two-thirds as long as its own height. First tergite faintly sculptured. Second tergite with a few punctures on the dorso-basal part; rest of the dorsal side with dense microsculptures; lateral region with punctures and pubescence. Sixth tergite with five very irregular transverse rows of shallow pits; interspaces and inside of pits rugulose. Ovipositor sheath visible from above.

*Specimens examined*: INDIA: Mysore, 1 ♀ Coll. No. C. U. 187 on pin, 2. x. 1968, Joseph and Lal. JAVA: 1 ♀, Coll. No. C. U. 807 on pin, 3-9-iv. 1933, J. V. D. Vecht. JAVA: 1 ♀ Coll. No. C. U. 802 on pin, 12, v. 1935, J. V. D. Vecht. (Coll. No. C. U. 807 and Coll. No. C. U. 802 are from Bishop Museum, Honolulu). Coll. Nos. C. U. 1704-1707 from the collections of Forest Research Institute, Dehra Dun. Coll. No. C. U. 1890 from the collections of Magyar Nemzeti Museum, Budapest. Coll. No. C. U. 955 from the collections of Museum National d'Histoire Naturelle (Paris). Coll. Nos. C. U. 789, 802 and 807 from the collections of Rijksmuseum van Natuurlijke Historie, Leiden.

*Types*: Present in the British Museum (Natural History), London.

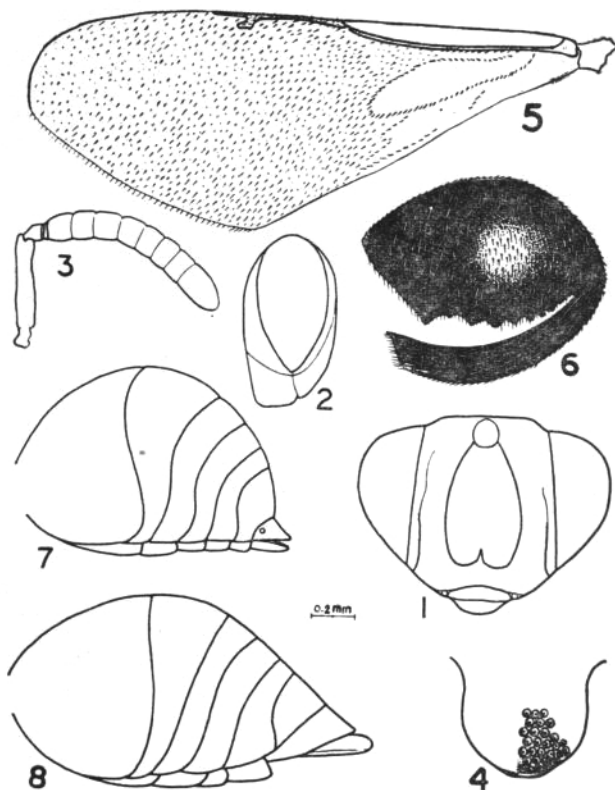
*Distribution*: India, Malaya, Java, Vietnam, Hong Kong, Taiwan and Philippines.

*Hosts*: *Atteva fabriciella* Swed. (Fam. Yponomeutidae), defoliator of *Ailanthus excelsa*.

*Affinities*: This species seems to be related to *B. menoni* Joseph *et al.* in having: (i) almost similar colouration; (ii) preorbital and postorbital carinae; and (iii) close punctures on the thorax. But *B. menoni* differs from *B. lugubris* in having: (i) the apex of scutellum not emarginate; (ii) antennae slender and scape longer than segments four to six combined (whereas in *B. lugubris*, antennae are stout and shorter than segments four to six combined); (iii) median ocellus equal in size to the lateral (whereas in *B. lugubris* median ocellus is distinctly larger than lateral); (iv) there is no median longitudinal carina on the scutellum in *B. menoni*.

**17. *Brachymeria menoni* Joseph et al. (17: Figs. 1-8)**

*Male*: Length 2.9 mm. Black; tegulae dull brownish. Coxae, trochanters and femora black. Fore and mid tibiae black with a small dirty brownish-yellow patch at base and apex; tarsi pale yellow. Hind tibiae black with a faint brownish colouration at the tip; tarsi pale brownish. Pubescence sparse and dirty-white.



17: Figs. 1-7. — *Brachymeria menoni* Joseph et al. (♂)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, fore wing; 6, hind femur and tibia;  
7, abdomen in lateral view; 8, abdomen of ♀ in lateral view.

*Head* (Fig. 1) width subequal to the width of thorax, a little less than one and one-third its own length; vertex shallowly pitted, the interspaces between the pits and inside of the pits rugose. Scrobe deep, smooth and shiny, its maximum width a little over half the interocular space, attaining the front ocellus. Length of scrobe a

little more than one and three-fourths its maximum width; parascrobal space about half the width of scrobe. Length of eye (Fig. 1) two and a half times its width. Median ocellus equal to the size of the lateral; the distance between median and lateral ocelli one-third the interocellar distance; interocular space two and one-third times interocellar distance; interocellar distance four and a half times ocellocular distance. Width of clypeus five times its median length; width of labrum four times its median length. Width of ocellar area a little more than three-fourths the interocular space; interocellar distance two and one-fourth times the maximum diameter of the lateral ocellus. Frons with distinct preorbital carina (Fig. 1); postorbital carina present, reaching the genotemporal margin (Fig. 2); inter-antennal projection moderately developed. Lateral ridges of scrobe not produced in front of the antennal toruli; area below scrobe without a median smooth portion. Height of malar space two-fifths the height of eye; front and hind genal angles nearly rectangular (Fig. 2). Antenna (Fig. 3) slender; scape not exceeding front ocellus, longer than segments four to six combined, contracted beyond the middle; pedicel a little longer than wide; ring segment about seven times as wide as long; fourth and fifth segments subequal; sixth, seventh and eighth subequal in length; ninth and tenth subequal; club about two and a half times the length of tenth segment, about one and a half times its own width; segments four to ten gradually increasing in thickness.

*Thorax* provided with rounded, reticulate, umbilicate and close pits (Fig. 4); interspaces of pits narrow and rugose. Mesoscutum one and a half times as wide as long. Scutellum almost of equal length and width, rather low in profile, gently declined posteriorly, its apical margin explanate and entire. Fore wing (Fig. 5) two and a half times as long as wide; marginal vein a little less than half the submarginal; postmarginal a little more than one-third the marginal and about twice the stigmal. Hind coxa on ventral side with distinct punctures and without an inner protuberance or tooth. Hind femora about one and three-fourths as long as wide, outer side minutely and densely punctured, rather mat, with moderate pubescence; its inner side with fewer punctures and pubescence and without a basal tooth; outer ventral margin with a row of eleven teeth (Fig. 6), the first tooth relatively large as in the figure.

*Abdomen* (Fig. 7) distinctly shorter than pronotum, mesoscutum and scutellum combined, highest about the middle, one and a half times as long as its height. First tergite smooth and shiny. Second tergite with a single row of punctures on the dorsal side at the basal part and finely microsculptured in the rest of the portions on the

dorsal side; lateral sides with punctures and pubescence. Sixth tergite small, distinctly and deeply pitted with two or three transverse rows of pits, each row with 12 to 15 pits; interspaces between pits rugose.

*Female*: Length 3.12 mm. Resembles the male in almost all features except that: (i) the abdomen (Fig. 8) is distinctly longer than pronotum, mesoscutum and scutellum combined; (ii) the sixth tergite is provided with two or three transverse rows of shallow, more or less faint pits; (iii) the second tergite is devoid of microsculptures but is smooth with a single row of punctures at the basal part on the dorsal aspect.

*Holotype* 1 ♂ Coll. No. 1531 on pin, its antenna and fore wing on slide No. 1581a and hind leg on slide No. 1581b, PAKISTAN: Abbottabad, Coll. Fletcher on 21. vi. 1916, from rose leaf roller. *Allotype* 1 ♀, Coll. No. C. U. 1582 on pin, collection data same as for Holotype. Types deposited in the Indian Agricultural Research Institute, New Delhi.

*Distribution*: India and N. Guinea.

*Hosts*: *Metriona circumdata* H. (Fam. Chrysomelidae) a pest of sweet potato.

*Affinities*: This species resembles *B. funesta* Habu. But *B. funesta* differs from this species in having: (i) the hind femora black with the apex yellowish; (ii) posterior carina branched.

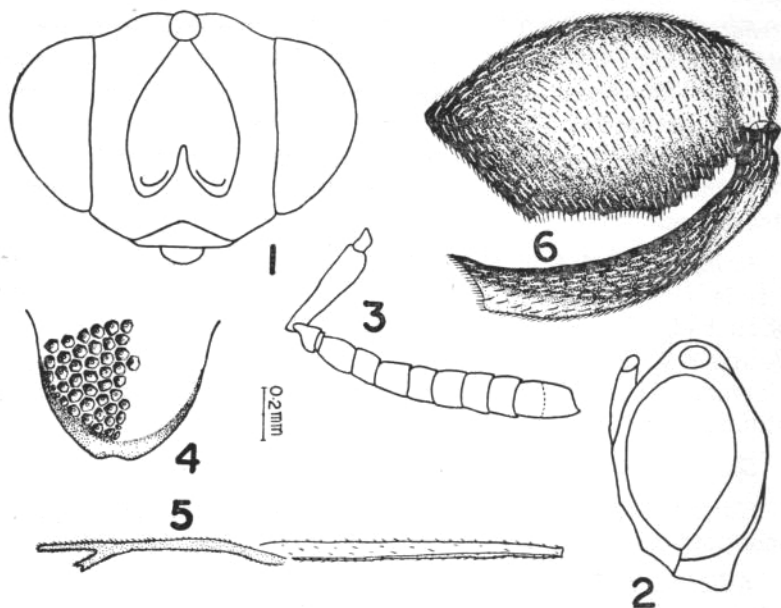
*B. raoi* Joseph *et al.* also resembles *B. menoni* in many features but *B. menoni* differs in having: (1) scrobe reaching the front ocellus; (ii) hind femora completely black without an apical yellow colouration; (iii) the distance between median and lateral ocelli one-third the interocellar distance (whereas in *B. raoi* it is about half the interocellar distance).

# **18. *Brachymeria punctifronta* Joseph *et al.* (18: Figs. 1 – 6)**

1970: *Brachymeria punctifronta* Joseph *et al.*, *Oriental Ins.*,  
4 (3): 283 – 286

*Male*: Length 3.2 mm. Black with tegulae pale yellowish-brown. Tip of the fore femur, the tibia and the tarsi dull yellow with a brownish patch on the inner side near the base of the fore tibiae. Mid femur at its tip, the tibia and tarsi dull yellow except for blackish-brown patch near the base of the tibia on the inner side which extends dorsally in a paler tone. Hind coxa black; femora black except the tip where it is pale blackish-yellow; tibia mostly black except for a

pale blackish-yellow patch in the basal half and another pale blackish-yellow area in the distal region; tarsi dull yellow. Pubescence whitish and sparse.



18 : Figs. 1-6. — *Brachymeria punctifrons* Joseph et al. (♂)

1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, fore wing venation; 6, hind femur and tibia.

*Head* (Fig. 1) a little wider than the maximum width of the thorax and hardly a little more than one and one-third as wide as its own length; surface of the head pitted with interspaces minutely rugose. Surface of the scrobe smooth and shiny; length of scrobe about one and a half times its maximum width; parascrobal space about one-third as wide as the width of the scrobe; scrobe deep occupying a little over half of the width of interocular space, attaining the front ocellus. Length of eye a little over two times its width. Median and lateral ocelli of equal diameter; the distance between median and lateral ocelli is equal to half the interocellar distance; interocular space hardly a little less than thrice the interocellar distance. Clypeus four times as wide as its median length. Width of labrum two and half times its median length. Width of ocellar area about two-thirds the width of interocular space; interocellar distance one and five-sevenths as wide as the maximum diameter of the lateral ocellus. Frons with preorbital carina absent; postorbital carina present, reaching the

genotemporal margin (Fig. 2); inter-antennal projection well developed; the lateral ridges of scrobe not represented in front beyond the antennal toruli. Height of malar space about one-third the height of the eye. The front genal angle and hind genal angle almost rectangular and as in figure. Antenna (Fig. 3) rather thin. Scape not exceeding the front ocellus, distinctly longer than the length of segments four to six combined, contracted in the middle part; pedicel a little longer than wide; ring segment a little over six times as wide as long; fourth segment a little longer than wide; fifth shorter than fourth; sixth segment a little longer and wider than fifth; seventh a little shorter than sixth; eighth as long as sixth. Ninth longer than seventh; tenth shorter than ninth; eighth, ninth and tenth equally wide and are the widest of the funicular segments. Club a little more than twice as long as segment ten, about one and two-thirds as long as its own maximum width.

*Thorax* provided with distinct, umbilicate, reticulate and rounded close pits with the interspaces rugose and narrow (Fig. 4); seta arising from each pit; mesoscutum twice as wide as long; parapsidal furrows distinct; scutellum a little wider than long, moderately high in lateral view, gently declined posteriorly with the apical margin explanate, weakly emarginate in the middle and as in figure, with moderate pubescence. Fore wing a little less than thrice as long as wide; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane; marginal vein (Fig. 5) about half the submarginal, postmarginal a little over one-third the marginal, two and one-third as long as stigmal. Hind coxa distinctly punctate with sparse pubescence; hind femur (Fig. 6) a little less than twice as long as wide; outer and inner sides rugose with close pubescence; ventral margin with ten teeth; hind tibia shorter than femur.

*Abdomen* about as long as the length of pronotum, mesoscutum and scutellum combined, highest in the middle, a little less than one and a half times as long as its own height; second tergite shagreened with close pubescence extending on a large area baso-laterally; sixth tergite closely pitted with sparse pubescence and four rows of close pits, each row having about ten to twelve pits.

*Holotype* ♂, Coll. No. 174 on pin, INDIA: Mavoor Road, Calicut, Kerala, Coll. Joseph and Lal, 6. viii. 1967. Type will be deposited in I. A. R. I., New Delhi, India.

*Specimens Examined*: Coll. No. C. U. 380 to 385 from the collections of Bishop Museum, Honolulu.

*Distribution*: India, Vietnam & Philippines

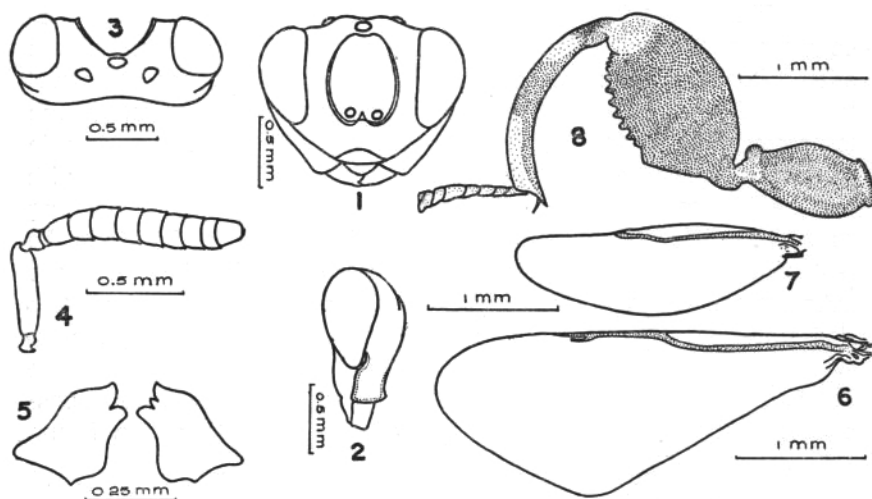
*Hosts:* Unknown

*Affinities:* *B. minamikawai* Habu and *B. banksi* Ashmead resemble this species closely, but differ from it in having the apex of scutellum rounded (in *B. minamikawai* it is prominently rounded) and area below scrobe smooth and glabrous.

**19. *Brachymeria burksi* Chhotani (19: Figs. 1–8)**

1966: *Brachymeria burksi* Chhotani, *J. Zool. Soc. India*, **18** (1 & 2) : 89–93.

*Female:* Length 4.2 mm. Black; tegulae, distal one-third of fore femur, fore tibia (except a dark brown spot in middle), distal one-fourth of middle femur, middle tibia (except for a dark brown ring in middle), distal tip of hind femur, hind tibia in part (ventrally, medially and at proximal tip, blackish-brown) and all tarsi pale yellow.



19 : Figs. 1–8. — *Brachymeria burksi* Chhotani (♀)

1, head in front view; 2, head in lateral view; 3, vertex in dorsal view; 4, antenna; 5, mandibles; 6, fore wing; 7, hind wing; 8, hind femur and tibia.

*Head* (Fig. 1) with eyes wider than long; frons, parascrobal space and vertex densely punctate with sculptured interspaces; scrobe smooth; malar ridge not branched, meeting the eye laterally a little behind its distal tip; preorbital and postorbital carinae absent; scrobe longer than wide, reaching the front ocellus; width about three times that of a parascrobal space. Eyes oval, narrower in front, width about two-thirds of length. Ocelli round; lateral ones situated at a distance (i.e. ocellocular line) of about their diameter from eye; median also



situated at about its diameter from the lateral ones. Antenna (Fig. 4) stout; scape not reaching the front ocellus. Clypeus transverse, semi-elliptical; with anterior margin almost straight; demarcated from frons by a prominent suture. Labrum broadly tongue-shaped. Right mandible (Fig. 5) with three teeth, middle tooth short and weak. Left mandible (Fig. 5) with two teeth.

*Thorax* densely and deeply punctate, interspaces sculptured, the sculpture becoming weaker posteriorly. Pronotum with the median two-fifths carinate at anterior margin; lateral face of pronotum with a complete dorsal margin, dorsal area shagreened, ventral area separated by a longitudinal ridge. Mesoscutum at anterior margin sculptured, not punctate. Scutellum with apex entire; laterally shagreened and with four incomplete vertical ridges. Fore wing (Fig. 6) fairly densely pilose, in proximal one-sixth pilosity present only in the region of anterior margin and on submarginal vein; postmarginal about twice the length of stigmal and about one-third of the marginal; submarginal about two and half times the length of marginal. Hind wing (Fig. 7) less hairy than fore wing, the proximal one-fourth pilose only at the anterior margin. Hind coxa without a median tooth; hind femur (Fig. 8) greatly swollen, outer surface densely setose and minutely sculptured, mat, inner surface weakly setose, ventral margin with eleven to thirteen teeth, basal teeth more widely spaced than the distal ones, outer basal tooth as long as the longest but wider; inner tooth absent.

*Abdomen* short and subacuminate. First tergite shining and with a few bristles on sides below the middle. Second tergite shagreened, smooth only near apex, with some bristles on sides and a few scattered ones in middle. Sixth tergite with umbilicate punctures, interspaces and surface within punctures shagreened. Ovipositor slightly exerted.

*Male*: Length: 3.6–3.9 mm. As in female except tergum six shorter and forming an angle of about 60° with longitudinal axis of body, and apical gastral sternum swollen and rounded at apex.

*Holotype* ♀ on pin (Z. S. I. Reg. No. 3839/H3). Bred in laboratory at Calcutta, October, 1965 from the infested pupae of *Aspidomorpha miliaris* F. collected at Barrackpore, West Bengal (coll. O. B. Chhotani, Oct., 1965). *Allotype* ♂ on pin (Z. S. I. Reg. No. 3840/H3). Data same as above. *Paratypes* 15 examples (8♀, 7♂, all pinned and mounted) Z. S. I. Reg. Nos. 3841/H3–3855/H3; 10 examples (5♀, 5♂) in spirit in a vial, Z. S. I. Reg. No. 3856/H3; and 2 slides with parts of a ♀ specimen, Z. S. I. Reg.

No. 3857/H3, with same data as for holotype. All deposited in National Zoological Collections, Zoological Survey of India, Calcutta. Paratypes also deposited as follows:— 4 examples (3♀, 1♂) in U. S. National Museum, Washington; 2 examples (1♀, 1♂) in British Museum (Nat. Hist.), London; and 2 examples (1♀, 1♂) in Indian Agricultural Research Institute, New Delhi.

*Distribution* : India (West Bengal).

*Host* : *Aspidomorpha miliaris* F. (Chrysomelidae, Coleoptera).

*Affinities* : *B. burksi* seems to be related to *B. prodeniae* Ashmead but can be easily distinguished from it in having somewhat larger size than *B. prodeniae* and in being parasitic on *Aspidomorpha miliaris* F.

*Remarks* : The above account of *B. burksi* is based on the original description given by Chhotani (1966).

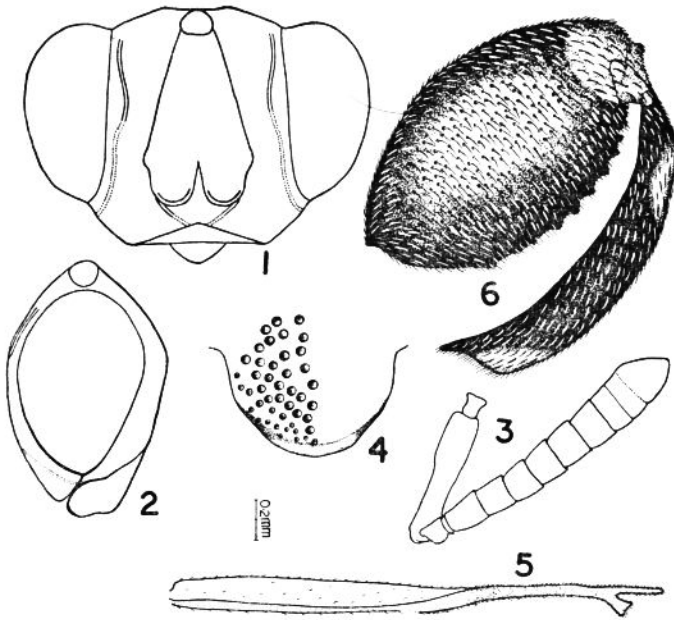
## 20. *Brachymeria medicina* Joseph *et al.* (20: Figs. 1 – 6)

1970: *Brachymeria medicina* Joseph *et al.* *Oriental Ins.*, **4** (3) : 289–291.

*Female* : Length 4 mm. Black; tegulae pale brownish-yellow with its basal margin brownish. Tip of the fore femur yellowish-brown; tibia mostly yellowish-brown on its internal aspect; this colouration on the external aspect is limited to narrow areas basally and at the tip, the rest being blackish. Mid femur with its tip brownish-yellow; tibia brownish-yellow at its base and at the tip, the intervening area being black, mostly confined to the external aspect. Tip of the hind femur yellowish-brown on its outer aspect; rest of the femur blackish. Hind tibia mostly black with a small subbasal yellowish-brown patch and a similarly coloured distal patch. Tarsi brownish-yellow. Dorsal region of the thorax with sparse white pubescence, lateral regions with close white pubescence.

*Head* (Fig. 1) a little wider than thorax, one and one-third as wide as long, surface of the head with large pits which are reticulate and close; interspaces narrow and rugose. Surface of scrobe smooth and shiny; length of scrobe about one and a half times its own width; parascrobal space a little less than half the width of the scrobe; scrobe deep occupying slightly less than three-fifths the width of the interocular space, attaining the front ocellus. Length of eye two and one-fourth its width; median ocellus slightly larger than lateral; the distance between the lateral and median ocelli is a little less than one-third the interocular distance. Interocular space about three times the intero-

cellar distance. Clypeus a little less than seven times as wide as long and almost triangular as in Fig. 1. Labrum two and two-thirds as



20 : Figs. 1-6. — *Brachymeria medicina* Joseph *et al.* (♀)

1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, fore wing venation; 6, hind femur and tibia.

wide as its median length. Width of ocellar area three-fourths the width of interocular space; interocellar distance one and three-fourths the maximum diameter of the lateral ocellus. Frons with preorbital carina more or less faint or absent, (Fig. 1) often widely abbreviated and not reaching the fronto-genal suture; postorbital carina present and reaching the genotemporal margin (Fig. 2). Inter-antennal projection well developed. Lateral ridges of scrobe faintly produced in front and as in Fig. 1. Height of malar space about one-third the height of the eye. Front genal angle acute and rounded; hind genal angle obtuse and rounded off. Antenna (Fig. 3) rather stout; scape not exceeding the front ocellus; scape distinctly longer than the length of segments four to six combined; contracted a little after the middle part. Pedicel a little longer than wide; ring segment three and a half times as wide as long; fourth segment distinctly longer than wide; fifth shorter than fourth; segments six to nine of equal length; segments four to eleven gradually increasing in width; club a little

less than two and a half times as long as the length of the tenth segment, about one and a half times as long as its maximum width.

*Thorax* generally rugose with distinct umbilicate pits which are rounded and small; interspaces mostly broader than the diameter of the pits. Mesoscutum about one and two-thirds as wide as long. Scutellum (Fig. 4) a little shorter than wide; moderately high. In lateral view, gently declined posteriorly, apical margin explanate, rounded off in the middle and with very little pubescence. Fore wing about two and three-fourths as long as wide; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane; marginal vein (Fig. 5) a little over half the submarginal; postmarginal a little less than one-third the marginal, about two times as long as stigmal. Hind coxa punctate and with dense pubescence; hind femur (Fig. 6) one and two-thirds as long as wide, outer side with small punctures and pubescence, inner side with closer pubescence; the ventral margin with twelve teeth disposed as in figure; hind tibia longer than hind femur.

*Abdomen* a little longer than the length of pronotum, mesoscutum and scutellum combined, highest in the middle, one and two-fifths as long as its height. First tergite smooth and shiny, not extending beyond the middle. Second tergite shagreened and shiny with a basal transverse row of small pubescence which extends to several rows in the lateral areas. Sixth tergite generally rugose and closely pubescent, provided with about six rows of large pits, the inside of these pits also being rugose.

*Holotype* ♀ Coll. No. 175 on pin, and its antenna, fore wing and hind leg on slides Nos. 18, 19a & 19b respectively. INDIA: Medical College Campus, Calicut, Kerala. Coll. Joseph & Lal, 23.ii.68. Type will be deposited at Indian Agricultural Research Institute, New Delhi.

*Distribution* : India.

*Host* : Unknown.

*Affinities* : *B. tachardiae* Cam. resembles this species in many features but differs from it in having: (i) the postorbital carina weak or faint; (ii) preorbital carina more well developed than that of this species.

*Remarks* : This species may be a variety of *B. thracis* Crawford. But since we have not been able to see any of the type material of *B. thracis* Crawford, we are not quite sure of the identity or relationship of this species with *B. thracis* Crawford.

**21. *Brachymeria tachardiae* Cameron (21: Figs. 1 - 6)**

1913: *Chalcis tachardiae*, Cam., *Ind. For. Rec.*, IV, p. 93

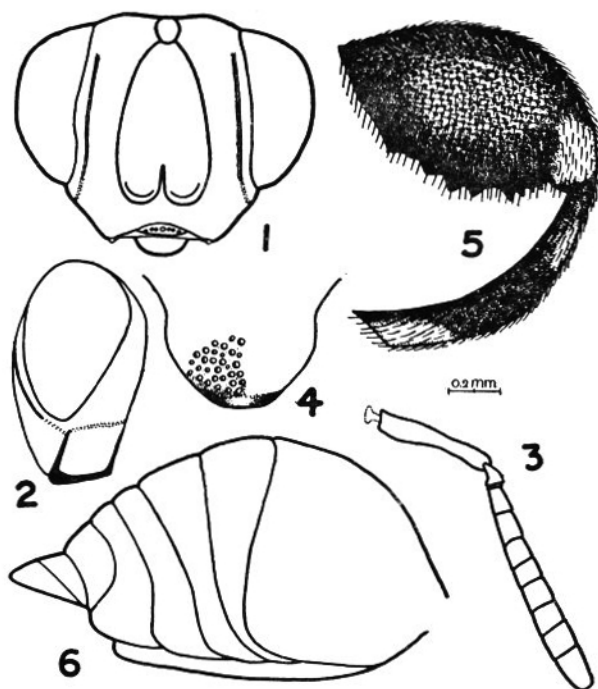
1915: *Chalcis tachardiae*, Imms & Chatterjee, *Ind. For. Mem.*, **3**: 34, pl. VII, f 26

1922: *Chalcis tachardiae*, Waterston, *Ind. For. Rec.* **IX**, p. 58

1924: *Chalcis tachardiae*, Husain, *Rep. Proc. Fifth Ent. Meet. Pusa.*, p. 35.

1925: *Chalcis tachardiae*, Remarkr., *Spol. Zeyl.*, **XIII**, p. 239.

*Female*: Length 2.5–3.5 mm. Black; tegulae pale yellow. Coxae, trochanters and femora reddish-black except the distal ends of femora which are yellow; fore and mid tibiae yellow with reddish-brown colouration in the middle; hind tibiae reddish-black with yellow patches subbasally and apically with the base pale brownish-yellow. Pubescence silvery-white,



**21 : Figs. 1–6. — *Brachymeria tachardiae* Cameron (♀)**

1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, hind femur and tibia; 6, abdomen in lateral view.

Head (Fig. 1) width subequal to that of thorax, one and one-fourth as wide as long. Vertex coarsely pitted, pits often coalesce. Scrobe fairly deep, smooth and shiny; its maximum width two-thirds the interocular space; length of scrobe one and three-fourths its own maximum width, attaining the front ocellus; parascrobal space at its shortest distance a little less than half the maximum width of scrobe. Length of eye (Fig. 1) a little over two and a half times its width. Median ocellus larger than lateral; the distance between median and lateral ocelli a little less than half the interocellar distance; interocular space twice the interocellar distance; interocellar distance six times ocellocular distance. Width of clypeus six times its median length; width of labrum three times its median length; width of ocellar area five-sixths the interocular space; interocellar distance two and one-fourth the maximum diameter of the lateral ocellus. Frons with pre-orbital carina becoming obliterated near the malar ridge (Fig. 1), postorbital carina (Fig. 2) very faint. Inter-antennal projection thin and narrow. Lateral ridges of scrobe not produced in front of the antennal toruli; area below scrobe without a raised median portion but provided with sparse pits in the middle, with interspaces between pits smooth. Height of malar space (Fig. 1) a little less than half the length of eye. Front genal angle slightly acute (Fig. 2); hind genal angle (Fig. 2) slightly obtuse. Antennae (Fig. 3) slender; scape reaching the front ocellus distinctly longer than the segments four to seven combined; pedicel longer than wide, ring segment narrow. Width of segments four to ten gradually increasing; club a little longer than its basal width.

*Thorax* provided with rounded, small umbilicate pits (Fig. 4); interspaces between the pits smooth and as broad as the diameter of the pits in some places and half as broad in other places on mesoscutum and scutellum. Mesoscutum hardly a little less than one and three-fourths as wide as long. Scutellum with width subequal to its length, relatively a little low in profile, gently declined posteriorly; apical margin explanate and rounded off (Fig. 4). Dorsal margin of the lateral face of pronotum complete. Fore wing about three times as long as wide. Hind coxa with distinct punctures and pubescence on ventral side without an inner tooth. Hind femur one and four-fifths as long as wide, its outer side (Fig. 5) moderately punctate and pubescent; outer ventral margin with a row of ten teeth (Fig. 5); inner side without a basal tooth.

*Abdomen* (Fig. 6) distinctly longer than pronotum, mesoscutum and scutellum combined; hardly a little less than one and three-fourths as long as its own height. First tergite smooth; second tergite

with pits and pubescence on sides. Sixth tergite with about five transverse rows of faint pits. Ovipositor sheath clearly visible from dorsal side.

*Specimens examined:* A few specimens from *Eublemma amabilis* from *Laccifer lacca* collected on 7-7-37, have been examined from Forest Research Institute, Dehra Dun, India, 5 ♀♀, Coll. P. M. Glover.

*Distribution:* India.

*Hosts:* 1) *Eublemma amabilis* (Fam. Noctuidae) from *Laccifer lacca* (Fam. Lacciferidae); 2) *Hypsiphyla* sp. (Fam. Pyralidae)

*Affinities:* This species resembles *B. nephantidis* Gahan in many respects but *B. nephantidis* can be separated from *B. tachardiae* in having: (i) the base of the hind tibiae completely black; (ii) post-orbital carina distinct and well developed (whereas in *B. tachardiae* it is faint); (iii) punctures on the thorax close and interspaces narrow. *B. hime* Habu also shows similarity to *B. tachardiae* but can be easily separated because of the following features in the former: (i) scape short, not reaching the front ocellus; (ii) postorbital carina well developed; (iii) interspaces between the pits on mesoscutum and scutellum narrow (whereas in *B. tachardiae* the interspaces between the pits are half as broad as the diameter of the pits on the scapulae and in the median portions of the scutellum).

*Remarks:* In the original descriptions of Cameron (1913) and of Imms & Chatterjee (1915) the tibiae have been described as broadly yellow at base and apex. But we have noted in all the specimens (bred from *E. amabilis* from *Laccifer lacca*) at F. R. I., Dehra Dun, that the base of the hind tibia is dull yellow or pale brownish-yellow with a more clear yellowish colouration subbasally (Fig. 5) and the apex of the hind tibia is yellow as in the original description. In Cameron's description (loc. cit.) the abdomen of the female is described as not quite so long as the thorax. But it is found to be distinctly longer than the thorax in the specimens we have examined at Forest Research Institute, Dehra Dun.

**22. *Brachymeria nephantidis* Gah. (Pl. 1: Figs. 1-5; Pl. 2: Figs. 1, 2, 4 & 5)**

1930: *Brachymeria nephantidis* Gahan, *Proc. U. S. N. Mus.* No. 2831, art. 77, p. 5.

1934: *Brachymeria nephantidis* Ramakr. & Margab, *J. Bombay, nat. Hist. Soc.*, **XXXVII**, p. 194.

*Female:* Length 3.77-4.15 mm. Black; tegulae yellowish. Fore, mid and hind coxae black. All trochanters black with small brownish

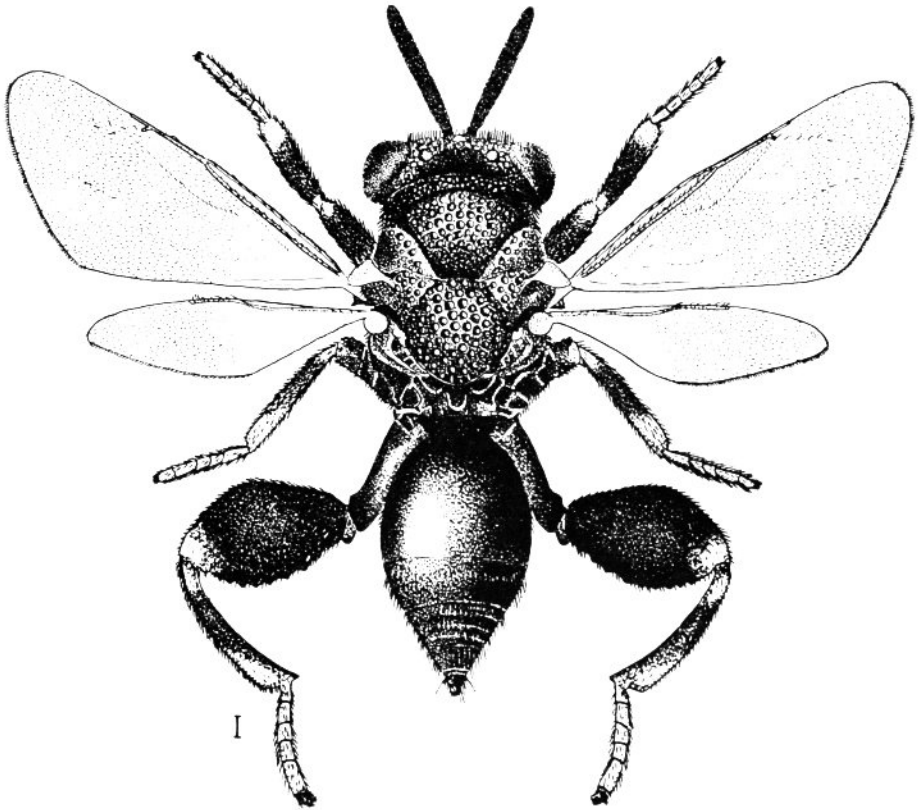


areas at both the extremities. Fore and mid femora black with a small yellowish tip. Hind femur black with an yellowish spot at the distal end. Fore and mid tibiae black in the middle, anterior and posterior ends yellowish. Hind tibia black in the middle and along the inner margin; subbasal and distal portions yellowish; basal area of the hind tibia brownish with a reddish tinge (in some specimens the basal area is pale brownish-red). All tarsi pale brownish-red. Pubescence moderate and whitish.

*Head* (Pl. 1: Fig. 1) almost as wide as thorax, a little less than one and one-fourth times as wide as its own length. Surface of the head pitted with irregular shallow pits. Scrobe deep, smooth and shiny. The length of scrobe about twice its own width and occupies over half the interocular space. Length of the eye about two and one-fourth times its own width, median ocellus slightly larger than lateral; the distance between median and lateral ocelli about one-third the interocellar distance; interocular space two times the interocellar distance; interocellar distance a little over five times ocellocular distance. Width of clypeus about five times its median length. The surface of clypeus is sparsely punctate, especially at the dorsal half with smooth interspaces. Width of labrum about two times its median length. Width of ocellar area a little more than three-fourths interocular space; interocellar distance a little less than three times the diameter of the lateral ocellus. Frons with distinct preorbital carina which becomes abbreviated towards the vertex. Postorbital carina present and reaches the genotemporal margin (Pl. 1: Fig. 3). Inter-antennal projection moderately developed. Lateral ridges of scrobe not produced in front of the antennal toruli; the area below scrobe in the middle is fairly smooth and shiny and with a few small punctures but the area is not clearly demarcated as a distinct region; height of malar space distinctly less than one-third the height of eye. Antenna (Pl. 1: Fig. 4) fairly stout, scape not exceeding the front ocellus, almost as long as segments 4-8 combined (4-7 combined in the male); pedicel distinctly longer than its width; ring segment about four times as wide as long; length of fourth segment slightly more than its width, almost equal to the length of fifth segment. Segments five to ten almost equal in length, their length slightly less than width, club about twice the length of segment ten and more than twice its own thickness.

*Thorax* (Pl. 1: Fig. 5) provided with small, rounded, umbilicate and close pits, interspaces of the pits rugose and narrow; mesoscutum a little less than one and three-fourths as wide as long; scutellum a little wider than long, gently declined posteriorly, apical margin rounded or entire with moderate pubescence. Fore wing (Pl. 2: Fig. 1)





*Brachymeria nephantidis* Gahan (♀)

a little over two and a half times as long as wide, pubescence sparse in the basal area and dense towards the distal region; marginal vein about half the submarginal; postmarginal a little more than one-fourth the marginal and a little less than twice the stigmal. The outer surfaces of hind coxa finely sculptured and closely pubescent without an inner ventral tooth. Hind femur (Pl. 1: Fig. 2) on outer side provided with fine punctures and pubescence with the interspaces of the punctures weakly rugose. The femur has a row of 9-11 (usually 10) small pointed teeth on its ventral margin. Hind tibia longer than hind femur.

*Abdomen* (Pl. 2: Fig. 5) rather long with a broad base and narrow and pointed tip, distinctly longer than (shorter in the male) pronotum, mesoscutum and scutellum combined and a little less than one and three-fourths as long as wide; first tergite smooth and shiny; second tergite finely shagreened, rather densely hairy at the sides and with a single row of hairs near the anterior dorsal margin; sixth tergite weakly pitted (extremely shallow pits) and hairy with the interspaces rugose. Ovipositor sheath distinctly visible from above.

*Male*: Length 3.07-3.55 mm. Resembles the female except for a shorter antenna and longer abdomen.

*Specimens examined*: A number of specimens reared from pupae of *Nephantis serinopa* Meyr., a pest of coconut. Coll. Nos. 1115 to 1120, 1188 to 1226 from the collections of Faculty of Entomology, Tamilnadu Agricultural University, Coimbatore. Coll. Nos. 1433 to 1441 from the collections of Indian Agricultural Research Institute, New Delhi. Coll. No. 234 & 235 from the collections of University of Agricultural Sciences, Bangalore.

*Type*: preserved in U. S. Natl. Museum (Cat. No. 42223)

*Host*: *Nephantis serinopa* M. (Fam: Chryptophasidae)

*Distribution*: India and Ceylon.

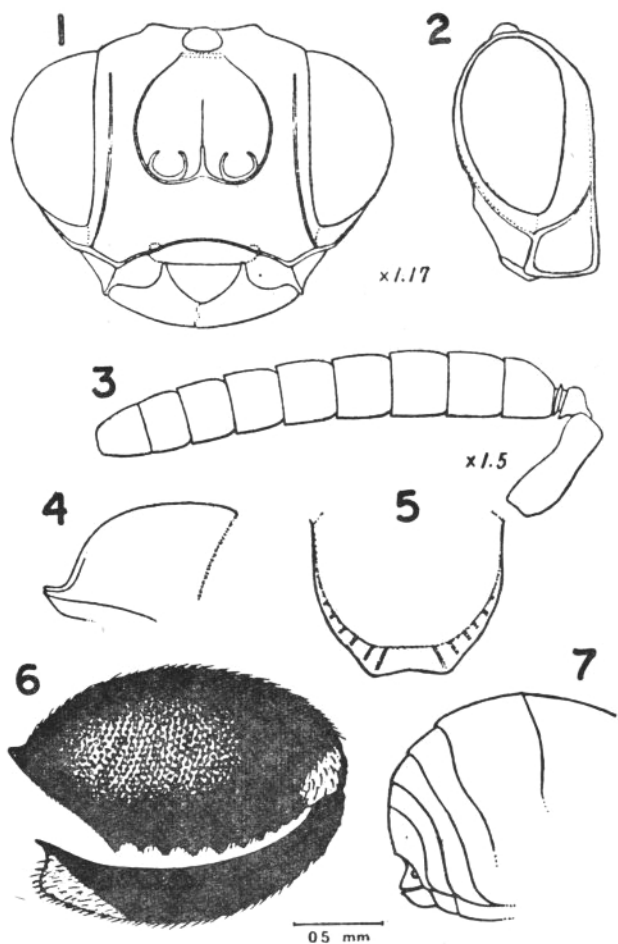
*Affinities*: *Brachymeria nephantidis* closely resembles *B. (Neobrachymeria) nosatoi* Habu, another pupal parasite of *N. serinopa* but *B. (N.) nosatoi* differs in having the following characters: (i) abdomen distinctly longer in the females of *B. (N.) nosatoi*; (ii) *B. (N.) nosatoi* is comparatively larger in size; (iii) legs in *B. (N.) nosatoi* have clear large yellowish patches whereas in *B. nephantidis* the patches are markedly smaller and yellowish-brown; (iv) the base of hind tibia is usually blackish or brownish in *B. nephantidis* whereas it is reddish in *B. (N.) nosatoi*; (v) fore tibia in *B. (N.) nosatoi* is provided with a black patch in the middle on outer, inner and ventral sides, but dorsally the patch is yellow. In *B. nephantidis* the black patch encircles the middle of the fore tibia.

**23. *Brachymeria kamijoi* Habu, (23: Figs. 1-7)**

1960: *Brachymeria kamijoi* Habu, *Bull. Nat. Inst. Agr. Sci. No. 11*, p. 188-191.

1962: *Brachymeria kamijoi* Habu, *Fauna Japonica*, p. 51-53.

*Male*: Length 4.8 mm. Black; tegulae clear yellow, with obtuse-triangular black patch at base. Coxae and trochanters black; femora black, with yellow apex, but base of mid femora brown, apical yellow



**23:** Figs. 1-7. — *Brachymeria kamijoi* Habu (♂)  
 1, head in front view; 2, head in lateral view; 3, antenna;  
 4, scutellum in lateral view; 5, scutellum in dorsal view;  
 6, hind femur and tibia; 7, abdomen in lateral view.

patch of hind femora (Fig. 6) relatively small; fore tibiae yellow, with blackish patch at middle, black patch interrupted on dorsal side, mid tibiae yellow at basal and apical areas, black at middle, hind tibiae (Fig. 6) mostly black, with one small yellowish spot at basal one-sixth, with rather long yellow patch at apex, border between apical yellow part and black part fairly oblique. Pubescence on body silvery grey, slightly yellowish.

*Head* (Fig. 1) a little narrower than thorax; punctation shallow, somewhat fainter on genae; interspaces of pits weakly carinate; area below scrobe uniformly pitted though somewhat irregularly; surface in scrobe smooth but rugose on dorsal part; ocellar area two-thirds as wide as interocular space at level of hind ocelli; interocellar distance two and one-half times as wide as major axis of hind ocelli; frons with distinct preorbital carina on each side; scrobe deep, rather wide, occupying three-fifths of width of interocular space; apex interrupted from front ocellus by rugose narrow area; inter-antennal projection very narrow; area below scrobe almost flat; height of malar space one-third as high as compound eye; postorbital carina (Fig. 2) distinct, reaching posterior margin of genotemporal regions though sinuate; front genal angle somewhat acute, hind angle nearly rectangular though rounded. Antenna (Fig. 3) rather stout; scape relatively shorter, not reaching front ocellus, a little longer than segments 4 to 5 combined, gently dilated before base; pedicel wider than long, swollen near apex on dorsal side; ring segment fairly short; segments 4 to 6 slightly increasing in width. Segments 6 to 10 slightly decreasing in width, segment 4 almost as long as segment 5, a little wider than long; club twice as long as segment 10.

*Thorax* compactly pitted on dorsal side, interspaces of pits fairly narrow, weakly carinate, with rather distinct microsculpture throughout, though somewhat faint on median area of scutellum; mesoscutum one and one-fourth times as wide as long; parapsidal furrows moderately grooved; scutellum (Figs. 4 & 5) somewhat convex, high in lateral aspect, apical explanate part wide, apex faintly emarginate, forming two weak lobes. Fore wing two and one-half times as long as wide; marginal vein three-fourths to four-fifths as long as submarginal; postmarginal one-fourth as long as marginal, three times as long as stigmal. Hind coxae compactly strongly punctate and densely pubescent on ventral side; hind femora (Fig. 6) one and five-sixths times as long as wide, outer side densely distinctly punctate and densely pubescent, almost shiny or faintly shagreened, inner side distinctly densely punctate and pubescent, but punctures and pubescence somewhat less dense than on outer side, inner ventral

side without protuberance near base, outer ventral margin with ten or eleven teeth.

*Abdomen* (Fig. 7) globose; first tergite smooth; second tergite minutely densely punctate on dorsal side and on lateral sides, punctures becoming faint near dorso-basal area, where some large punctures present except in the middle; sixth tergite with compact pits, interspaces of pits carinate, not reticulate.

*Female*: Length 5.0 mm. Head similar to that of ♂, scrobe not reaching front ocellus as in ♂. Scape of antennae also short like in ♂, not reaching front ocellus, a little longer than segments 4 to 5 combined. Scutellum a little more sinuate at apex. Hind coxae without protuberance on inner ventral side. Abdomen globose like in ♂, depressed from behind, so almost perpendicular at posterior area, longest part behind base of sixth tergite in profile. Ovipositor sheath fairly short, never visible from dorsal side, only slightly projecting beyond epipygium.

*Types*: Preserved in the Entomological Institute, Hokkaido University, Japan.

*Specimens Examined*: Coll. No. 452 from the collections of Bishop Museum, Honolulu.

*Distribution*: Philippines and Japan.

*Hosts*: Unknown

*Affinities*: *Brachymeria nephantidis* Gahan resembles this species closely but differs from it in having: (i) the scape almost as long as segments 4–7 in ♂; (ii) apex of scrobe not interrupted from front ocellus by rugose narrow area; (iii) apex of scutellum entire.

*Remarks*: The above account of *B. kamijoi* Habu is based on the description given by Habu (1960).

#### **24. *Brachymeria fulvitarsis* Cameron (24: Figs. 1–5)**

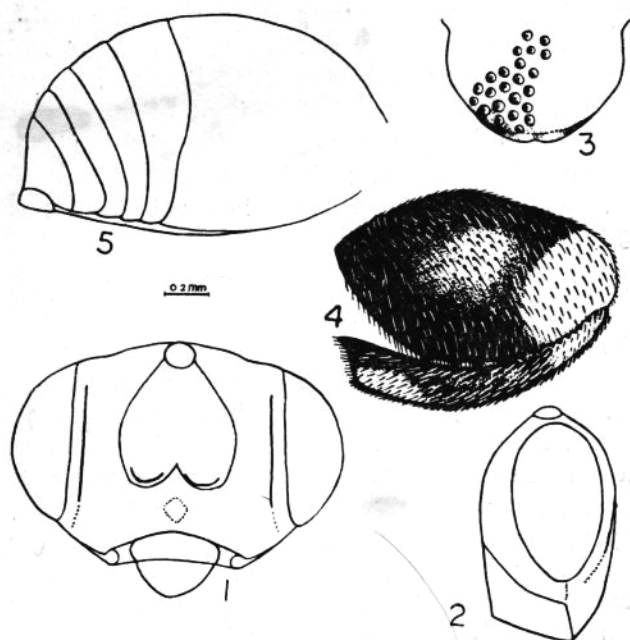
1906: *Chalcis fulvitarsis* Cameron, *J. Bombay, nat. Hist. Soc.*, **XVII**, p. 94.

1922: *Chalcis fulvitarsis* Waterston, *Ind For. Rec.*, **IX**, p. 56

1925: *Chalcis fulvitarsis* Ramakr., *Spol. Zeyl.*, **XIII**, p. 239.

*Male*: Length 3.7 mm. Black; tegulae yellow; coxae, trochanters and femora black except the apices of femora which are rufo-fulvous. Fore and mid tibiae rufo-fulvous at the base and apex and brownish-black in the middle; tarsi rufo-fulvous. Hind tibia with a subbasal

yellow spot and an apical yellow patch; rest of the portions brownish-black; tarsi brownish-yellow. Pubescence sparse and white.



24: Figs. 1-5. — *Brachymeria fulvitaris* Cameron (♂)

1, head in front view; 2, head in lateral view; 3, scutellum in dorsal view; 4, hind femur and tibia; 5, abdomen in lateral view.

**Head** (Fig. 1) a little wider than thorax, hardly a little less than one and one-third as wide as long; surface of head deeply pitted with the interspaces rugose. Scrobe deep, slightly rugose; the maximum width of scrobe a little less than two-thirds the interocular space at the level of the lateral ocelli, attaining the front ocellus. Length of scrobe a little less than one and two-thirds its maximum width; parascrobal space a little more than one-third the width of scrobe. Length of eye (Fig. 1) a little more than two and a half times its width; median ocellus slightly larger than lateral; the distance between median and lateral ocelli a little more than one-third the interocular distance; interocular space a little more than two and a half times the interocular distance; interocular distance a little less than three times the ocellocular distance. Width of clypeus a little less than five times its median length; width of labrum a little less than two and a half times its median length; width of ocellar area about three-fourths that

of the interocular space; interocellar distance two and one-fifth the maximum diameter of the lateral ocellus. Preorbital carina present but becomes abbreviated near the malar ridge; postorbital carina well developed and reaches the genotemporal margin. Frons with distinct, deep punctures; region below scrobe with punctures and a small smooth area in the middle; inter-antennal projection moderate; lateral ridges of scrobe slightly produced in front of the antennal toruli (Fig. 1); height of malar space more than one-third the height of eye; front genal angle slightly acute; hind genal angle almost rectangular (Fig. 2). Antenna with minute dirty-white pubescence; scape not exceeding the front ocellus.

*Thorax* with rounded, umbilicate pits (Fig. 3) with the interspaces between the pits in some cases as broad as the diameter of the pits and in others half as broad. Mesoscutum two-thirds as wide as long; width of scutellum a little more than its length, gently declined posteriorly; apical margin explanate, slightly emarginate with sparse pubescence. Fore wing a little less than thrice as long as wide; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane; marginal vein a little less than half the sub-marginal; postmarginal hardly a little less than one-third the marginal, about twice the stigmal. Hind coxa on ventral side with punctures and without a tooth; its dorsal side smooth. Hind femur (Fig. 4) a little less than twice as long as wide, outer side with faint, sparse punctures, and interspaces between the punctures wide; inner side with less sparse punctures and without a basal tooth; outer ventral margin with a row of eleven teeth (Fig. 4).

*Abdomen* (Fig. 5) distinctly longer than the length of pronotum, mesoscutum and scutellum combined, highest in the middle, one and three-fourths as long as wide. First tergite smooth. Second tergite faintly shagreened. Sixth tergite with three transverse rows of almost rounded pits; the basal row with about sixteen pits, the middle row with about twelve pits and the apical row with about nine pits.

*Specimen examined*: 1 ♂. Coll. No. B. M. 1957-24 (British Museum (Natural History) London) on pin, PAKISTAN: Karachi, Coll. S. Mahdihassan in 1955 from Lac insect. Determined by Z. Boucek 1970. Deposited in British Museum (Natural History) London. One specimen (Coll. No. C. U. 1070) from the collections of the Faculty of Entomology, Tamilnadu Agricultural University, Coimbatore, was also examined.

*Distribution*: India and Pakistan.

*Hosts*: Lac insects.

*Affinities* : *B. tachardiae* (Cameron) shows close resemblance to *B. fulvitorsis* (Cameron) but differs from it mainly in having the apex of scutellum rounded off and the postorbital carina very faintly developed.

**25. *Brachymeria minuta* (Linn.) (25: Figs. 1-8)**

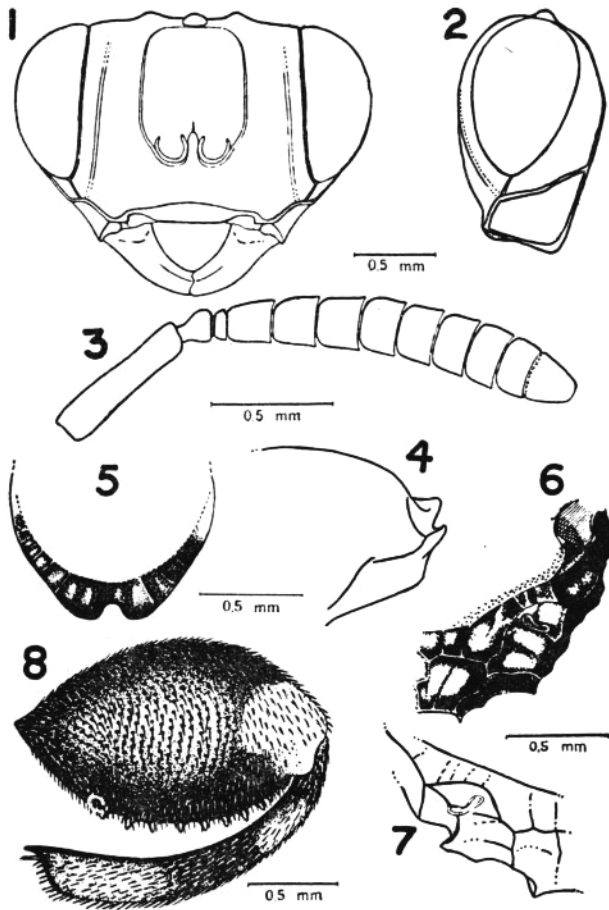
- 1767 : *Vespa minuta* Linn. *Syst. Nat.*, ed. 12, **1**: 952.
- 1790 : *Chalcis pusilla* Rossi, *Fauna Etrusca*, **2**: 59.
- 1834 : *Chalcis brevicornis* Klug, *Symb. Phys.*, Dec. 4, Pl. 37, fig. 10.
- 1834 : *Chalcis minuta* Walker, *Ent. Mag.* **2**: 30-31.
- 1859 : *Chalcis scrobiculata* Forster, *Verh. Nat. Ver. Preuss. Rheinl.*, **16**: 93.
- 1859 : *Chalcis tricolor* Forster, *ibid.*: 98.
- 1875 : *Chalcis fumata* Thomson, *Hymen. Scand.* **4**: 18.
- 1883 : *Chalcis minuta* Kirby, *Journ. Linn. Soc. London, Zool.* **17**: Pl. 4, figs. 45, 46.
- 1910 : *Chalcis minuta* Crawford, *Tech. Ser. U. S. Dept. Agr., Ent.* no. 19, pt. 2: 14, 18, figs. 19-21.
- 1910 : *Chalcis paraplesia* Crawford, *ibid.*: 14, 19, figs. 22, 23. *Syn. nov.*
- 1912 : *Chalcis jezoensis* Matsumura, *Thousand Insects of Japan*, suppl. **4**: 166-167, pl. 52, fig. 15. *Syn. nov.*
- 1916 : *Chalcis pusilla* Masi, *Ann. Mus. Civ. St. Nat. Genova* (3) **7**: 89-92, pl. 12, fig. 2.
- 1916 : *Chalcis minuta* Masi, *ibid.*: 92-96, pl. 12, fig. 4.
- 1916 : *Chalcis minuta* var. *alborufa* Masi, *ibid.*: 94-95, pl. 12, Fig. 7.
- 1922 : *Chalcis minuta* Ruschka, *Konowia* **1**: 224, 231-232.
- 1923 : *Chalcis minuta* Mercet, *Rev. Fitopat.* **1**: 16-17, 19.
- 1929 : *Brachymeria brevicornis* Masi, *Mem. Soc. Ent. Ital.* **8**: 119.
- 1930 : *Chalcis jezoensis* Matsumura, *Illustrated Thousand Insects of Japan*, 2 (Hym.): 151 (in Japanese), 55 (in English). pl. 15, fig. 15.
- 1931 : *Chalcis jezoensis* Matsumura, *6000 Illustrated Insects of Japan Empire*: 33.



- 1932 : *Brachymeria paraplesia* Ishii, *Icon. Ins. Jap.* (first edit.) : 347, fig. 675.
- 1936 : *Brachymeria* sp. Masi, *Mushi* **9** : 47–50.
- 1936 : *Brachymeria* sp. Masi, *ibid.* : 50–51.
- 1936 : *Brachymeria minuta* Masi, *ibid.* : 51.
- 1938 : *Brachymeria paraplesia* Mani, *Cat. Ind. Ins.*, pt. 23 : 57.
- 1940 : *Brachymeria* Masi, *Mushi* **13** : 1–2.
- 1949 : *Brachymeria minuta* var. *alborufa* Masi, *Bull. Soc. Ent. Ital.* **79** : 92.
- 1949 : *Brachymeria brevicornis* Masi, *ibid.* : 92–93.
- 1950 : *Brachymeria brevicornis* Masi, *Eos*, tomo extraord. : 35, 40.
- 1950 : *Brachymeria minuta* forma *pusilla* Masi, *ibid.* : 35, 40.
- 1950 : *Brachymeria minuta* Masi, *ibid.* : 35–41.
- 1950 : *Brachymeria minuta* var. *alborufa* Masi, *ibid.* : 35, 41.
- 1950 : *Brachymeria scrobiculata* Masi, *ibid.* : 35, 41–42.
- 1950 : *Brachymeria paraplesia* Ishii, *Icon. Ins. Jap.* (revised edit.) : 1405, fig. 4049.
- 1951 : *Brachymeria minuta* Boucek, *Acta Ent. Mus. Nat. Pragae*, **27**, suppl. 1 : 19, 20, 28–29, figs. 11, 25, 26.
- 1952 : *Brachymeria minuta* Nikol'skaya, *Opred. Faune SSSR*, **44** : 89.
- 1956 : *Brachymeria minuta* Boucek, *Bull. Res. Council Israel*, **5**, B : 232.
- 1960 : *Brachymeria minuta* Habu, *Bull. Nat. Inst. Agr. Sci. Ser. C. No. 11*, p. 146–151.
- 1962 : *Brachymeria minuta* Habu, *Fauna Japonica*, p. 15–19.
- 1971 : *Brachymeria putturensis* Joseph et al. *Oriental. Ins.* Vol. **5** (2) : 229–242.
- 1971 : *Brachymeria putturensis longigastralis* Joseph et al. *ibid.* : 232–234.

*Female* : Length 4.2–6.7 mm. Black; tegulae yellow, with pale brown margin. Coxae shiny black; trochanters black or somewhat

reddish; femora black, with whitish yellow apical part; fore tibiae brownish-yellow, and whitish at basal part and at outer apical part, with blackish long patch at outer median part; mid tibiae shiny black, with whitish-yellow basal and apical parts; hind tibiae black with apical part and pre-basal part yellow or brownish-yellow (rarely hind tibiae almost wholly brownish). Abdomen shiny black, lateral and latero-posterior margins of tergites slightly reddish. Pubescence on body greyish-white.



25 : Figs. 1 - 7. — *Brachymeria minuta* (Linn.) (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in lateral view; 5, scutellum in dorsal view;  
6, propodeum without lateral tooth behind the spiracle;  
7, propodeum with lateral tooth; 8, hind femur and tibia.

*Head* (Fig. 1) slightly narrower than thorax; surface rather distinctly pitted, interspaces of pits carinate, surface in scrobe almost smooth though with some very faint wrinkles; width of ocellar area two-thirds or more than two-thirds as wide as interocular space at level of hind ocelli; interocellar distance two and one-third to two and one-half times as wide as major axis of hind ocelli; compound eyes glabrous, rather convex; frons with more or less distinct preorbital carinae, which become indistinct near the malar ridge; scrobe deep, occupying one-half or less than one-half of width of interocular space, attaining front ocellus; inter-antennal projection narrow; area below scrobe impressed along fronto-clypeal suture; height of malar space one-half as high as compound eyes; postorbital carina (Fig. 2) distinct, reaching posterior margin of genotemporal regions; front genal angle and hind genal angle nearly rectangular though somewhat rounded; right mandible with two blunt teeth. Antennae (Fig. 3) rather stout; scape not exceeding front ocellus, a little shorter than the length of segments 4 to 6 combined, slightly contracted before middle; pedicel almost as long as wide; ring segment relatively long; segment 4 as long as wide, segments 5 to 10 becoming a little shorter and wider apically, segment 5 as long as segment 4, a little wider than long; club longer than twice of segment 10.

*Thorax* moderately and distinctly pitted on dorsal side, interspaces of pits partially carinate, smooth except faint microsculpture on pronotum; mesoscutum one and one-fifth times as wide as long; scutellum (Fig. 4) high in lateral view, rather gently declined posteriorly, apical part explanate and reflexed, apex distinctly emarginate (Fig. 5) and bilobed; propodeum (Figs. 6 & 7) fairly declined posteriorly, with one blunt tooth behind spiracles at sides, tooth sometimes indistinct. Fore wing two and three-fifth times as long as wide; marginal vein one-half as long as submarginal; postmarginal two-fifths as long as marginal, one and one-half times as long as stigmal. Hind coxa rather distinctly punctate and pubescent on ventral side, without protuberance on inner ventral side; hind femur (Fig. 8) one and three-fourths to one and four-fifth times as long as wide, rather sparsely punctate and pubescent on outer side, with minute, very sparse, pubescent punctures on inner side, with one small blunt tooth at inner ventral side near base, with usually eleven to thirteen teeth on outer ventral margin.

*Abdomen* rather pointed posteriorly, more or less longer than pronotum, mesoscutum and scutellum combined, widest before middle, five-sixths as wide as thorax. First tergite smooth. Second tergite with rather distinct microsculpture except on basal and apical narrow areas and on ventro-lateral parts, minutely sparsely punctate and pubescent

(or bristled) at dorso-basal and dorso-lateral parts. Sixth tergite weakly pitted and sparsely bristled and with distinct microsculpture. Ovipositor sheath visible in dorsal view.

**Male :** Length 3.7 – 5.5 mm. Scape of antennae sometimes with yellowish patch near base. Antennae generally not widened towards apex, but sometimes thick like in ♀; funicle with trichoid sensillae on ventral side.

**Specimens examined :** Coll. Nos. C. U. 403, 405, 416, 425, 444, 463, 469, 472, 506, 512, 522, 570, 675, 719 and 724 from the collections of Bishop Museum, Honolulu. Coll. Nos. C. U. 771, 773, 776, 779, 784, 787 and 793 from the collections of Rijksmuseum van Natuurlijke Historie, Leiden. Coll. Nos. C. U. 960 to 962 from the collections of Museum National d'Histoire Naturelle, Paris. Coll. Nos. C. U. 1561 to 1580 from the collections of Indian Agricultural Research Institute, New Delhi. Coll. Nos. C. U. 1919 & 1320 from Magyar Nemzeti Museum, Budapest and Coll. Nos. C. U. 23 to 54 from the collections of Zoology Department, University of Calicut, Kerala.

**Distribution :** India, Japan, Korea, Manchuria and North China, Mongolia, Siberia, Formosa, Botel-tobaco Is., Central Asia, Asia Minor, Europe, North Africa, Vietnam, Philippines, Java, Cambodia, and B. N. Borneo.

**Hosts :** This species is parasitic on some Diptera: *Sarcophaga lineata* in Europe (after Saunders, 1881); *Sarcophaga* in Spain (after Mercet, 1923); *Sarcophaga?* sp. in the U. S. S. R. (after Ruschka, 1922); Sarcophagidae in Europe and Japan (after Crawford, 1910; Howard and Fiske, 1911; Ishii, 1932, 1950; Shiraki, 1940, 1957; Boucek, 1951); Calliphoridae, Sarcophagidae, etc. in Japan (after Nakada, 1957; Mitani and Otsuka, 1957; Uemoto, 1957); Tachinid puparia from nests of *Yponomeuta malinella* Zellar (Lepidoptera, Yponomeutidae) and other Tachinid puparia in the U. S. S. R. (after Nikol'skaya 1934 and Habu, 1960).

According to Habu (1960) the following hosts may be secondary: *Tortrix viridana* Linn. (Tortricidae), *Sparganothis pilleriana* Schiffermuller et Denis (Tortricidae), and *Zygaena filipendulae* Linn. (Zygaenidae); *Aporia crataegi* Linn. (Pieridae), *Tyria jacobaeae* Linn., *Earias insulana* Boisduval and *E. biplaga* Walker (Noctuidae); *Virachola livia* Klug (Lycaenidae), *Polychrosis botana* Schiffermuller et Denis (Eucosmidae), *Clysiana ambiguella* Hubner (Phaloniidae), *Polychrosis botrana* Schiffermuller et Denis, *Zygaena trifolii* Esper (Zygaenidae), and *Myrmeleon formicarius* Linn. (Neuroptera, Myrmeleonidae).

**Affinities:** *Brachymeria fonscolombei* Duf. is very closely related to *B. minuta* (Linn.). The typical form of *B. fonscolombei* has reddish femur but in some cases the hind femur becomes black. In this case it becomes more or less difficult to distinguish *B. fonscolombei* from *B. minuta*. According to Habu the following characteristics may be useful in identifying these species in such cases. In typical *B. fonscolombei* the tegulae, the apical patch of the hind femora, and two patches on the hind tibiae are whitish, whereas in *B. minuta* they are more or less yellowish, though sometimes whitish aberrations occur. The apical whitish patch on the hind femora of *B. fonscolombei* is generally limited on the outer and dorsal sides, not extending into the inner side; the pits on the genotemporal region are somewhat smaller; the hind femora are narrower, viz., they are one and four-fifth times to a little more than twice as long as wide, whereas in *B. minuta* the hind femora are not more than one and four-fifth times as long as wide. The dorsal side of the hind femora of *B. fonscolombei* from the outer aspect is dilated from the base to the widest part, then also slightly contracted towards the apex so the dorsal side is weakly angulate, the outer ventral teeth of the hind femora are often broader in *B. minuta*.

**Remarks :** The following are the synonyms of *B. minuta* Linnaeus : 1. *B. scrobiculata* Forster; 2. *B. alborufa* Masi; 3. *B. tricolor* Forst.; 4. *B. brevicornis* Klug.; 5. *B. paraplesia* Crawford; 6. *B. putturensis* Joseph *et al.*; 7. *B. putturensis longigastralis* Joseph *et al.*; 8. *B. bilobata* Cameron; 9. *B. fuchnensis* Habu.

*B. minuta* Linnaeus is a very variable species with variations in colouration of hind femora and in the nature of punctation on the thorax.

The above account of *B. minuta* is based on the descriptions given by Habu (1960) and Boucek (1951).

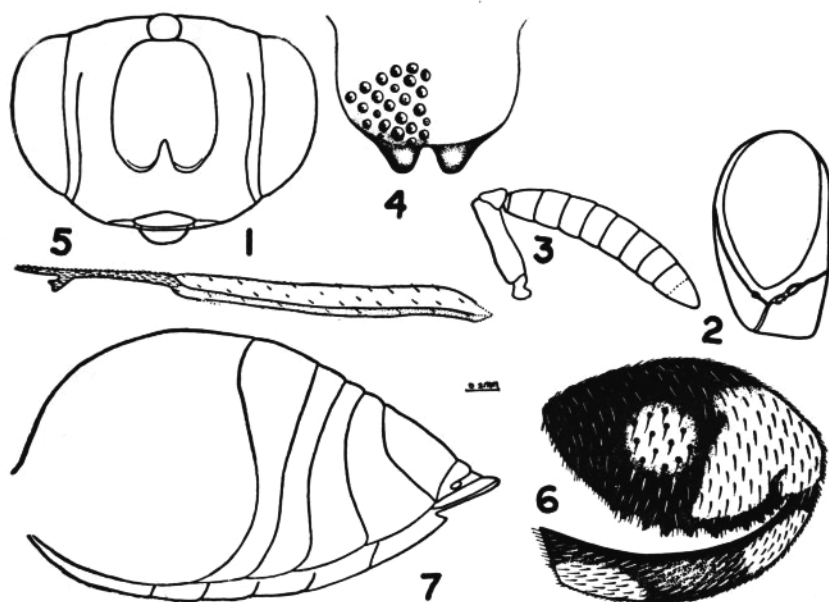
## **26. *Brachymeria minuta calopeplae* Joseph *et al.* 26:**

Figs. 1 - 7)

1972: *Brachymeria calopeplae* Joseph *et al.*, *Indian Forester*, **98** (9) : 554 - 556

**Female :** Length 4.12 - 4.80 mm. Black; tegulae yellow. scape with a yellow patch on the ventral margin on outer side from near the base to almost three-fourths of its length. Front and mid coxae, trochanters and femora brownish-black except the distal ends of femora which are yellow; tibiae yellow with a brownish patch in the middle. Hind coxa and trochanter black; femur black with almost half

the distal portion yellow as in the figure; tibia yellow with pale reddish colouration at the base and middle and this pale reddish colouration extends from base to tip along the ventral margin. Pubescence sparse and whitish.



26 : Figs. 1-7. — *Brachymeria minuta calopeplae* Joseph et al. (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, fore wing venation;  
6, hind femur and tibia; 7, abdomen in lateral view.

*Head* (Fig. 1) a trifle less wide than the width of thorax, a little less than one and a half times its own length; surface of head deeply pitted; the interspaces between the pits coalesce; scrobes deep, smooth and shiny; the maximum width of scrobes a little less than three-fifths the interocular space, attaining the front ocellus. Length of scrobes one and one-fourth its maximum width. Length of eye (Fig. 1) three times its width; median ocellus larger than lateral; the distance between median and lateral ocelli a little over one-third the interocular distance; interocular space about two and three-fourths the interocular distance; interocular distance a little over two times the ocellular distance. Width of clypeus four times its median length; width of labrum about three times its median length; width of ocellar area a trifle less than two-thirds the interocular space;

interocellar distance two and three-fifths the maximum diameter of the lateral ocellus. Frons with distinct preorbital carinae; postorbital carina present and as in figure 2. Area below scrobe without a median smooth portion; lateral ridges of scrobe not produced in front of the antennal toruli; inter-antennal projection moderately developed; height of malar space (Fig. 1) one-third the height of eye. Front genal angle and hind genal angle as in figure 2. Antenna (Fig. 3) stout; scape reaching the front ocellus but not exceeding, longer than segments four to six combined; pedicel length subequal to its width; ring segment about five times as wide as long; thickness gradually increasing from segments four to eight; segment nine hardly a little wider than segment eight and a little wider than segment ten; club a little wider than long and a little more than twice as long as the length of the tenth segment.

*Thorax* provided with rounded and umbilicate pits (Fig. 4); interspaces between the pits as broad as the diameter of the pits in the median portions of mesoscutum, scutellum and scapulae; the interspaces in the remaining portions half as broad as the diameter of the pits or shorter. Mesoscutum one and a half times as wide as long. Scutellum a little wider than long, moderately high in lateral view, gently declined posteriorly; apical flange explanate and deeply emarginate at middle (Fig. 4) forming two lobes. Fore wing a little more than two and a half times as wide as long; marginal vein (Fig. 5) half the submarginal; postmarginal one-third the marginal, and equal to twice the stigmal. Hind coxa without a tooth on the inner ventral side, with deep punctures and pubescence on the ventral side. Hind femur (Fig. 6) one and two-thirds as wide as long; outer side with a row of 11 to 13 teeth; inner side with a tooth at base.

*Abdomen* (Fig. 7) rather pointed posteriorly, definitely longer than pronotum, mesoscutum and scutellum combined. First tergite smooth with a few punctures and pubescence on sides. Second tergite smooth or faintly shagreened with a few punctures and pubescence on sides. Sixth tergite with 5 transverse rows of distinct pits, interspaces between the pits rugulose. Ovipositor sheath well visible from above.

*Male:* Length 4.69 mm. Resembles the female in almost all features except in having the abdomen distinctly shorter than pronotum, mesoscutum and scutellum combined. Sixth tergite with five transverse rows of distinct pits, each row with several pits; pits a little more close than in the female.

*Holotype* 1 ♀ coll. No. C. U. 1740 on pin, its antenna and fore wing on slide No. 1740a and hind leg, fore leg and mid leg on slide

No. 1740b; INDIA, U. P., Dehra Dun, New Forest, Coll. N. C. Chatterjee on 11-x-1927 from *Calopepla leayana* pupa. *Paratype*: 15 ♀♀ on pins, collection data same as for the holotype. *Allotype* 7 ♂♂ on pins; coll. data same as for the Holotype. Types deposited at F. R. I. Dehra Dun, INDIA. One paratype (No. 1729) deposited in the U. S. National Museum.

*Distribution*: India.

*Hosts*: *Calopepla leayana* (Fam. Cassididae).

*Remarks*: This subspecies can be separated from *B. minuta* (Linn.) in having the distal half of the hind femur almost completely yellowish on the outer aspect. We have examined a number of specimens of this subspecies all having similar colouration of the hind femur. Sixth tergite is distinctly pitted in this subspecies. We have earlier described this subspecies as a new species (*B. calopeplae*) but later placed it as a subspecies of *B. minuta* (Linn.).

## 27. *Brachymeria fonscolombei* (Dufour) (27: Figs. 1-9)

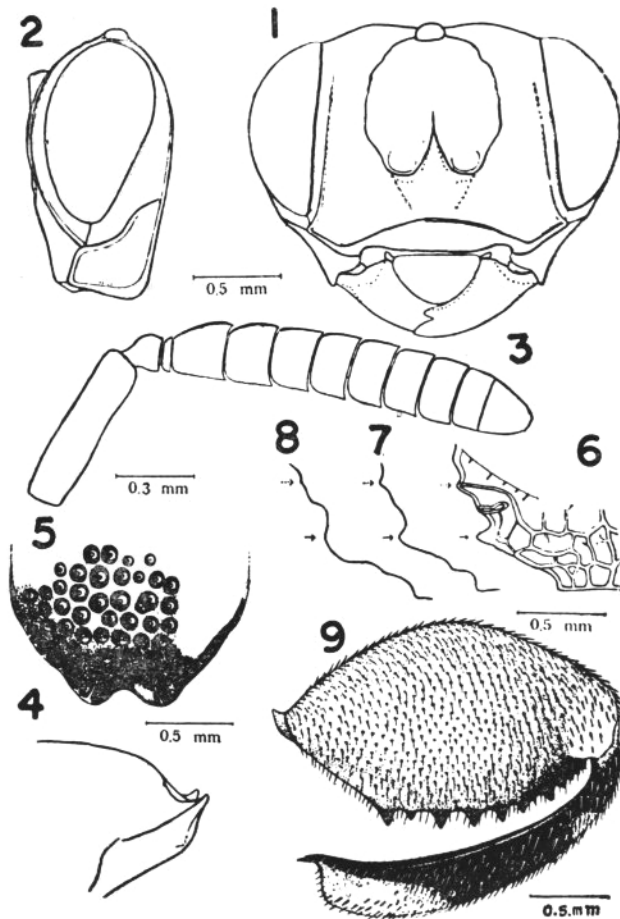
- 1834: *Chalcis podagrica* Walker (nec Fabricius), *Ent. Mag.*, **2**: 31-32.
- 1841: *Chalcis fonscolombei* Dufour, *Ann. Soc. Ent. France*, **10**: 11-19, pl. 1, fig. II (larvae and pupae)
- 1883: *Chalcis callipus* Kirby, *Journ. Linn. Soc. London, Zool.*, **17**: 75; Syn. nov.
- 1888: *Chalcis mikado* Cameron, *Proc. Manch. Lit. Phil. Soc.*, **36**: 1-2. Syn. nov.
- 1898: *Chalcis micado* (!) Dalla Torre, *Cat. Hym.*, **5**: 389.
- 1904: *Chalcis mikado* Ashmead, *Journ. New York Ent. Soc.*, **12**: 147.
- 1910: *Chalcis fonscolombei* Crawford, *Tech. Ser. U. S. Dept. Agr., Ent.*, no. **19**, pt. 2: 15, 20.
- 1910: *Chalcis callipus* Crawford, *ibid.*: 15, 20.
- 1916: *Chalcis fonscolombei* Masi, *Ann. Mus. Civ. St. Nat. Genova* (3) **7**: 82-84, pl. 12, fig. 6.
- 1916: *Chalcis neglecta* Masi, *ibid.*: 84-86, pl. 12, fig. 3.
- 1922: *Chalcis neglecta* Ruschka, *Konowia*, **1**: 224, 232-233.
- 1923: *Chalcis neglecta* Mercet, *Rev. Fitopat.* **1**: 16, 19.



- 1932: *Brachymeria fonscolombei* Ishii, *Icon. Ins. Jap.* (first edit.), 347, fig. 674.
- 1933: *Brachymeria fonscolombei* Roberts, *Tech. Bull. U. S. Dept. Agr. no. 365*: 2-4, fig. 1.
- 1936: *Brachymeria fonscolombei* Masi, *Mushi* **9**: 51.
- 1936: *Brachymeria fonscolombei* Burks, *Trans. Illinois State Acad. Sci.* **29**: 251, 254, figs. 8, 12.
- 1940: *Brachymeria fonscolombei* Masi, *Mushi* **13**: 1.
- 1950: *Brachymeria fonscolombei* Masi, *Eos, tomo extraord.* 34, 39.
- 1950: *Brachymeria fonscolombei* Ishii, *Icon. Ins. Jap.* (revised edit.): 1405, fig. 4048.
- 1950: *Brachymeria fonscolombei* forma *neglecta* Masi, *ibid.*: 35-40.
- 1951: *Brachymeria fonscolombei* Muesebeck, Krombein et Townes, *Agr. Monogr. U. S. Dept. Agr. no. 2*: 587.
- 1951: *Brachymeria neglecta* Boucek, *Acta Ent. Mus. Nat. Pragae* **27**, suppl. 1: 18, 20, fig. 147.
- 1952: *Brachymeria neglecta* Nikol'skaya, *Opred. Faune SSSR.* **44**: 90.
- 1954: *Brachymeria fonscolombei* Boucek, *Acta Ent. Mus. Nat. Pragae* **29**: 78, 79.
- 1960: *Brachymeria fonscolombei* Habu, *Bull. Nat. Inst. Agric. Sci., C. No. 11*. p. 152.
- 1960: *Brachymeria fonscolombei* Burks, *Trans. Amer. Ent. Soc.*, **LXXXVI**, 238-239.
- 1962: *Brachymeria fonscolombei* Habu, *Fauna Jopanica*, p. 22-26.
- 1972: *Brachymeria fonscolombei rufoflagellata* Joseph et al., *Oriental Ins.* Vol. **5** (2): 236-239.
- 1972: *Brachymeria fonscolombei nigriflagellata* Joseph et al., *Oriental Ins.* Vol. **5** (2): 239-242.

*Female*: Length 4.5-7.0 mm. Black. Antenna almost black, with scape more or less brownish or reddish, sometimes partially, sometimes wholly, funicle sometimes faintly reddish. Tegulae almost white, sometimes faintly yellowish; base reddish black. Fore and mid coxae almost shiny black; hind coxae black, shiny, generally

apical half reddish; trochanters black, or brownish or reddish; fore and mid femora shiny black, sometimes slightly reddish, apical part creamy-white; hind femora (Fig. 9) varying in colour, typically shiny brownish-red, sometimes light reddish, sometimes entirely blackish, or partially blackish; apex white or yellowish-white, white part generally not extending onto inner side, ventral teeth blackish; fore and mid tibiae shiny black, sometimes faintly reddish; basal and apical parts white or yellowish white, in fore tibiae dorsal side whitish, hind tibiae (Fig. 9) shiny black, with one small whitish patch or yellowish



27: Figs. 1-8. — *Brachymeria fonscolombei* (Dufour) (♀)

1, head in front view; 2, head in lateral view; 3, antenna;

4, scutellum in lateral view; 5, scutellum in dorsal view;

6-8, propodia showing variations of lateral teeth; 9, hind femur and tibia.

patch before base on dorsal side (this patch rarely disappearing), and with one large whitish patch or yellowish patch at apex on dorsal side, extending onto both outer and inner sides, but usually not reaching ventro-outer nor ventro-inner carina. Pubescence on body and bristles on abdomen whitish, and generally somewhat brownish on thorax. Reddish aberrations (even thorax and abdomen more or less reddish) and blackish aberrations are met with.

*Head* (Fig. 1) a little narrower than thorax, surface fairly pitted, pits on genae somewhat faint; frons with small smooth area without pits in middle below scrobe; surface in scrobe almost smooth; width of ocellar area two-thirds as wide as interocular space at level of hind ocelli; interocellar distance one and one-third to one and one-half times as wide as major axis of hind ocelli; frons with distinct pre-orbital carinae, base generally reaching fronto-genal sutures; scrobe fully deep, maximum width more than one-half as wide as interocular space, reaching front ocellus; inter-antennal projection acutely triangular; area below scrobe slightly convex at middle, more or less depressed along clypeus; height of malar spaces one-half as high as compound eyes; genae depressed near hind angle, postorbital carina distinct, reaching posterior margin of genotemporal regions (sometimes becoming faint near it); front genal angle almost rectangular; hind angle almost rectangular and rather widely rounded. Antennae (Fig. 3) rather stout; scape not exceeding front ocellus, as long as length of segments 4 to 7 combined, weakly contracted at apical one-third; pedicel almost as long as wide; segment 4 almost as long as wide, segments 5 to 10 slightly increasing in width and decreasing in length; segment 5 a little shorter and wider than segment 4; club more than twice as long as segment 10.

*Thorax* distinctly pitted on dorsal side, pits generally becoming somewhat larger and sparse posteriorly; interspaces of pits rather carinate on pronotum, but almost flat on other parts though narrow, smooth, microsculpture faintly visible on pronotum; mesoscutum almost as wide as long; scutellum (Figs. 4 and 5) rather gently declined posteriorly, apical part somewhat widely explanate and reflexed, gently sinuate at apico-lateral margins, distinctly emarginate and bilobed at apex; propodeum (Figs. 6, 7 and 8) with one protuberance at sides behind spiracles, protuberance sometimes rather sharp and distinct, sometimes dull and indistinct. Fore wing two and four-sevenths to two and five-sevenths as long as wide; marginal vein one-half to three-fifths as long as submarginal; post-marginal one-fourth as long as marginal, twice or less than twice as long as stigmal. Hind coxa with distinct dense punctures and

pubescence on ventral side, without protuberance on inner ventral side; hind femur (Fig. 9) one and four-fifths to a little more than twice as long as wide, outer side sparsely punctate and pubescent, without microsculpture, punctures small, inner side very minutely and very sparsely punctate and without microsculpture (so almost smooth), with one small protuberance near ventro-basal part; outer ventral margin with usually nine to eleven teeth, teeth relatively large and acute.

*Abdomen* somewhat pointed posteriorly, a little longer than pronotum, mesoscutum and scutellum combined, widest at middle, one-fifth to one-eighth narrower than thorax. First tergite smooth. Second tergite with sparse minute setiferous punctures on baso-dorsal part except narrow part at middle, punctures somewhat extending posteriorly at latero-dorsal parts and somewhat denser and larger on dorsal half of lateral parts, microsculpture rather distinct. Sixth tergite shallowly pitted, microsculpture distinct. Ovipositor sheath visible from above.

*Male*: Length 3.8–5.0 mm. Legs somewhat darker in colour than in ♀. Antennae usually less stout than in ♀; funicle with trichoid sensillae on ventral side.

*Types*: Lectotype ♀ and ♂ in Dufour Collection in Museum National d'Histoire Naturelle, Paris.

*Specimens examined*: Coll. Nos. C.U. 1301 to 1361 from the Collections of Indian Agricultural Research Institute, New Delhi. Coll. Nos. C.U. 1221 & 1229 from the collections of Faculty of Entomology, Tamilnadu Agricultural University, Coimbatore. Coll. Nos. C.U. 952 & 953 from the collections of Museum National d'Histoire Naturelle, Paris. Coll. Nos. C.U. 775 & 809 from the collections of Rijksmuseum van Natuurlijke Historie, Leiden. Coll. Nos. C.U. 364, 365, 371, 372, 417, 446, 470, 483, 508, 517, 536, 537, 538, 579, 680, 685, 686, 691 to 693, 698, 699, 706, 707, 709, 711, 713, 722 Nos. and 727 from the collections of Bishop Museum, Honolulu. Coll. C.U. 180 to 185 from the collections of Department of Zoology, University of Calicut, India. Coll. Nos. C.U. 1760 to 1762, 1765 to 1766, 1768 to 1773 and 1775 from the collections of Magyar Nemzeti Museum, Budapest.

*Distribution*: India, Central Asia, Mongolia, Siberia, China, Philippines, Taiwan, Thailand, N. Guinea, B. N. Borneo, Formosa, Botel-Tobago Is., Japan (Honshu, Shikoku, Kyushu, Okinawas), Korea, Europe, Africa, North America, New Jersey to Florida and West Indies.

*Hosts* : This is a primary parasite of blowflies (Sarcophagidae) and other muscoid Diptera, viz. Calliphoridae, Muscidae, Trypetidae, and Lepidoptera like Psychidae, Yponomeutidae, and Lymantriidae.

*Affinities* : *B. fonscolombei* is very closely allied to *B. minuta* (Linn.) in structure as well as in hosts and distribution. The typical form with reddish femora is easily recognizable, but the hind femora sometimes turn into black even in the female, being very often black in the male. In this case the identification is more or less difficult, but according to Habu, the following characteristics may be useful in identification. In typical *B. fonscolombei* the tegulae, the apical patch of the hind femora, and two patches on the hind tibiae are whitish (in *B. minuta* they are more or less yellowish, though sometimes whitish aberrations occur); the apical whitish patch on the hind femora is generally limited on the outer and dorsal side, not extending on to the inner side; the pits on the genotemporal regions are somewhat smaller; the hind femora are narrower, viz., they are one and four-fifths to a little more than twice as long as wide, and on the contrary, are not more than one and four-fifths as long as wide, in *B. minuta*; the dorsal side of the hind femora, seen from the outer side, is dilated straightly from the base to the widest part, thence also straightly contracted towards apex, so the dorsal side is weakly angulate, though it is rounded from base to apex in *B. minuta*; the outer ventral teeth of the hind femora are often narrower in *B. fonscolombei*.

*Remarks* : The above account of *Brachymeria fonscolombei* (Duf.) is based on the description given by Habu (1960).

## 28. *Brachymeria podagrica* Fabricius, (28: Fig. 1 – 7)

1787 : *Chalcis podagrica* Fabricius, *Mantissa Insectorum*, **1**: 272.

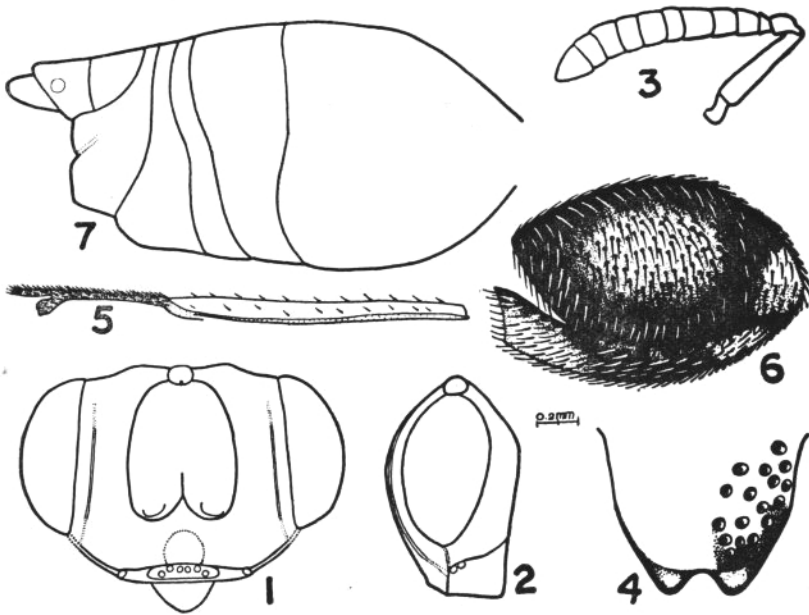
1834 : *Brachymeria podagrica* Walker, (nec Fabricius), *Ent. Mag.*, **2**: 31 – 32.

1868 : *Brachymeria pulchripes* Holm., *Eugen. Resa. Ins.*, p. 436.

1909 : *Chalcis pulchripes* Schmied, *Gen. Ins. Fas.*, **97**: p. 28.

*Female* : Length 5 mm. Head black, mandibles brown or somewhat dark brown. Antenna blackish-brown. Thorax black, shiny; tegulae pale yellow. Fore and mid coxae blackish; hind coxae reddish-brown. Femora brownish-red with the distal tips pale yellow. Fore

and mid tibiae reddish-brown with the base and apex pale yellowish. Hind tibiae reddish-brown with yellow colouration subbasally and apically. Tarsi brown, arolium and claws brownish or black (the reddish or brownish colouration of the legs is variable, becoming blackish in some specimens). Abdomen black. Pubescence on body and setae on abdomen dirty-white or brownish.



28 : Figs. 1-7. — *Brachymeria podagrica* (Fabricius) (♀)

1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, forewing venation; 6, hind femur and tibia;  
7, abdomen in lateral view.

*Head* (Fig. 1) width subequal to the width of thorax, one and two-fifths as wide as long. Vertex coarsely pitted, pits often coalesce. Scrobe deep, smooth and shiny; its maximum width a little over half the interocular space; length of scrobe about one and one-third its maximum width; attaining the front ocellus. Parascrobal space at its shortest length about half the maximum width of scrobe. Length of eye (Fig. 1) a little over two and two-thirds its width; median ocellus a little larger than lateral; the distance between median and lateral ocelli one-third the interocellar distance; interocular space two and two-thirds interocellar distance; interocellar distance about two and one-fifth ocellocular distance. Width of clypeus six times its median length; width of ocellar area a trifle less than two-thirds the

interocular space; interocellar distance two and two-thirds the maximum diameter of the lateral ocellus. Frons with distinct pre-orbital carinae (Fig. 1); postorbital carinae present, reaching the genotemporal margins (Fig. 2). Inter-antennal projection moderately developed. Lateral ridges of scrobe not produced in front of the antennal toruli; area below scrobe with a small smooth portion in the middle without pits (Fig. 1). Length of malar space (Fig. 1) a little less than half the length of eye. Front and hind genal angles (Fig. 2) nearly rectangular. Antenna (Fig. 3) not stout; scape not exceeding the front ocellus, almost equal to the segments four to six combined; pedicel longer than wide; ring segment twice as wide as long; segments four to ten gradually increasing in thickness; club a little over two and a half times as long as wide and three times the length of tenth segment.

*Thorax* provided with rounded, scattered pits on scutellum and mesoscutum. The interspaces between the pits smooth, shiny and broader than the diameter of the pits on the median regions of the mesoscutum, scapulae and scutellum (Fig. 4). Mesoscutum a little over one and three-fifths as wide as long, gently declined posteriorly, its apical flange explanate and emarginate (Fig. 4) with sparse pubescence. Fore wing a little less than two and two-thirds as long as wide. Marginal vein (Fig. 5) a little less than half the submarginal; postmarginal about one-third the marginal, one and a half times the stigmal. Hind caxa with its ventral side smooth with sparse punctures and pubescence, without an inner tooth. Hind femur (Fig. 6) about one and three-fourths as long as wide; its outer side smooth with very sparse punctures and pubescence, with a row of 12 or 13 black teeth; inner side with a basal tooth.

*Abdomen* (Fig. 7) distinctly longer than pronotum, mesoscutum and scutellum combined, a little over twice its height. First tergite smooth. Second tergite smooth in the basal half, distal half faintly shagreened. Sixth tergite finely shagreened with very few faint, sparse punctures and sparse pubescence. Ovipositor sheath clearly visible from dorsal side.

*Specimens examined*: 1 ♀ on pin, coll. No. C. U. 11; India, Kerala, Calicut, Mavoor Road, Coll. Joseph on 6. viii. 67, Det. Z. Boucek 1971; 1 ♀ on pin, Coll. No. C. U. 1978, INDIA: Kerala, Coll. Joseph on 27. x. 68; 1 ♀ on pin, Coll. No. C. U. 1774 FORMOSA: Coll. Teraso, date unknown; 1 ♀ on pin, Coll. No. 1775 JAVA: Samarang, Coll. E. Jacobson, date unknown. (Coll. Nos. C. U. 1774 & C. U. 1775, are from the collections of Magyar Nemzeti Museum, Budapest). Coll. Nos. C. U. 366, 377, 386, 388, 402, 407, 412, 438, 445, 493.

551, 585, 630, 679, 689, 701, 705 and 720 from the collections of Bishop Museum, Honolulu. Coll. Nos. C. U. 826 and 831 from the collections of Zoological Survey of India, Calcutta. Coll. Nos. C. U. 1604 to 1606 from the collections of Indian Agricultural Research Institute, New Delhi. Coll. No. C. U. 954 from the collections of Museum National d'Histoire Naturelle, Paris.

*Distribution* : India, Nepal, Malaya, Java, Laos, Vietnam, Hong Kong, Taiwan and Philippines.

*Affinities* : *B. fonscolombe* (Dufour) redescribed by Habu (1960) seems to be related closely to *B. podagrica* (Fbr.) in general colouration and in many other features but can be separated on account of the punctures on the thorax being closer and interspaces being narrower than those of *B. podagrica*. Further, in *B. fonscolombe* the hind coxae have distinct punctures and pubescence and antennae are rather stout. In consultation with Dr. Boucek we have come to the conclusion that *B. pulchripes* Holmgren is a synonym of *B. podagrica* Fbr.

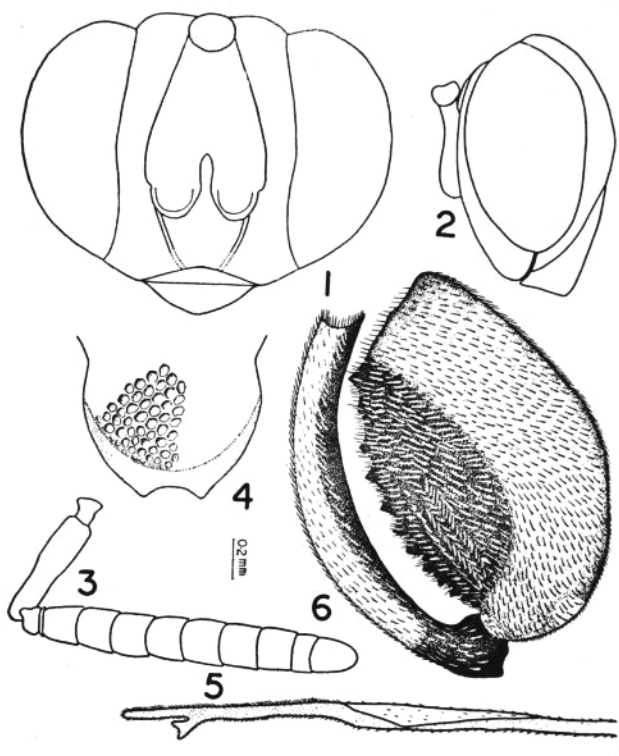
## 29. *Brachymeria bengalensis* Cameron (29: Figs. 1-6)

- 1897: *Chalcis bengalensis* Cameron, *Mem. Proc. Manchester Lit. Philos. Soc.*, **XLI** (4), p. 39.
- 1925: *Chalcis bengalensis* Ramakr., *Spol. Zeyl.*, **XIII**, p. 238.
- 1963: *Brachymeria yasumatsui* Habu., *Mushi* **37** (9): 111-114.
- 1970: *Brachymeria scrobatae* Joseph *et al.*, *Oriental Ins.*, **4** (3) 286-289.

*Female* : Length 4.48 to 4.6 mm. Black; tegulae yellowish-brown with the basal one-third brownish-black; distal half of fore femora, fore tibiae and fore tarsi, distal margin of the mid femur, mid tibia and mid tarsi yellowish. Hind trochanter blackish-brown. The major portion of the hind femur reddish-brown; the distal portion with a small pale yellowish-red patch (in some cases basal margin with a blackish patch extending to about one-third the outer aspect of the femora). Basal one-fifth of the hind tibia blackish, this black colouration extending to the distal end along the ventral margin; rest of the tibia, particularly along the dorso-lateral margin dull yellowish-black. Last tarsal segment blackish in the basal half and yellowish in the distal half. Lateral portions of the abdominal tergites pale blackish-brown. Pubescence on head and body dirty-white.



*Head* (Fig. 1) slightly broader than the maximum width of the thorax; one and one-fourth as wide as long. The surface of the head



29 : Figs. 1-6. — *Brachymeria bengalensis* Cameron (♀)

1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, forewing venation; 6, hind femur and tibia.

distinctly pitted, the interspaces of the pits carinate and finely rugose. Surface of the scrobe smooth and shiny, a little less than one and a half times as long as its maximum width; parascrobal space about one-fourth as wide as the width of the scrobe. Scrobe deep occupying two-thirds the interocular space, attaining the front ocellus. Length of the eye about two and a half times its width; median ocellus slightly larger than the lateral ocellus; the distance between lateral and median ocelli equal to half the interocellar distance; interocular space about one fourth interocellar distance. Width of clypeus about five times its length. Width of labrum one and two-thirds its length. Width of ocellar area four-fifths as wide as interocular space; interocellar distance two and one-fourth as wide as the maximum diameter of the lateral ocellus. Frons without preorbital carina; postorbital

carina (Fig. 2) present, reaching the genotemporal margin. Inter-antennal projection long and acuminate. Lateral ridges (Fig. 1) of scrobe continued forwards beyond the antennal toruli and almost reaches the clypeus. Height of malar space about one-sixth the height of the eye. The front genal angle nearly rectangular; hind genal angle slightly obtuse. Antenna (Fig. 3) not stout; longer than the thorax. Scape not exceeding the front ocellus, slightly longer than the combined length of the segments four to six; slightly contracted after the middle. Pedicel a little wider than long. Ring segment very short. Fourth segment hardly a little wider than long. Segment five, six and seven of equal length; sixth, seventh and ninth segments widest; segment eight a little longer than segment five. Segment nine a little longer than segment eight; segment ten as long as and as wide as segment five. Segments six, seven and nine of equal width; a little longer than segment five. Segment eight slightly wider than segment seven. Segment ten and club of equal width. Club hardly a little less than twice as long as segment ten; about one and three-fifths as long as its maximum width.

*Thorax* with the whole of the pronotum, mesoscutum, scapulae and scutellum (Fig. 4) provided with almost reticulate and close pits; interspaces of pits carinate, and with microscopic rugosities. Mesoscutum a little over one and a half times as wide as long; parapsidal furrows distinct. Scutellum distinctly less than one and a half times as wide as long, moderately high in lateral view and gently declined posteriorly; apical part explanate and reflexed, distinctly emarginate and bilobed and densely covered with pubescence. Forewing two and a half times as long as wide; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane. Marginal vein (Fig. 5) about half as long as submarginal vein; postmarginal about half as long as marginal vein, three times as long as stigmal. Hind coxa punctate and pubescent on ventral side. Hind femur (Fig. 6) about one and five-sevenths as long as wide; outer side with microscopic punctures and pubescence, inner side with larger pubescence; ventral margin with eleven to twelve black teeth as in figure. Hind tibia hardly a little longer than the hind femur.

*Abdomen* a little shorter than the length of pronotum, mesoscutum and scutellum combined, highest after the middle; about one and one-fourth as long as its own height. First tergite smooth and shiny. Second tergite with scattered pits and small pubescence in the basal median half; in the same half towards the lateral regions the pits become more prominent, closer and provided with longer pubescence; the distal half of second tergite rather smooth with

distinct microsculptures. Sixth tergite with large numbers of closely arranged pits and with close pubescence.

*Male* : Resembles the female in almost all respects except in : (i) Length : 4.5 to 4.7 mm.; (ii) width of head equal to that of thorax; (iii) antenna stouter than that of the female; (iv) antennal segments 5, 7, 8 & 9 of equal length; segments 6 & 9 of equal length; segment 10 slightly less wide than segment 9; club slightly less wide than segment 10.

*Specimens examined* : 1 ♀, Collection No. 164 on pin and its antenna, forewing and hind leg on slides Nos. 1, 2a & 2b respectively; INDIA: Calicut, Kovur. Coll. Joseph 29. x. 1967. ♂, Collection No. 165 on pin and its antenna, forewing and hind femur on slide No. 3, 4 & 5 respectively; INDIA: Calicut, Kovur Coll. Joseph on 22. x. 1967. Coll. No. 163 on pin and 1 ♂, No. 166 on pin; Calicut, Kovur, 29. x. 67 and 1 ♂, No. 166 Calicut, Devagiri, 23. vii. 67. Coll. Nos. C. U. 368, 374, 382, 489, 500, 624, 629, 636 and 721, from the collections of Bishop Museum, Honolulu. Coll. No. C. U. 830, from Zoological Survey of India, Calcutta. Coll. No. C. U. 963 from Museum National d'Histoire Naturelle (Paris). Coll. Nos. C. U. 1227 & 1228, from the Faculty of Entomology, Tamilnadu Agricultural University, Coimbatore. Coll. Nos. C. U. 1753 to 1897 and 1902 from the collections of Magyar Nemzeti Museum, Budapest.

*Distribution* : India, Malaya, Indonesia, N. Guinea, Vietnam, Laos, Thailand, Ryuke Islands, Formosa and Philippines.

*Affinities* : *B. amphissa* Walker, resembles *Brachymeria bengalensis* Cameron but differs from *B. bengalensis* in the absence of postorbital carina and the lateral ridges of scrobe not produced in front of the antennal toruli.

*Remarks* : In consultation with Dr. Boucek we came to the conclusion that *B. yasumatsui* Habu is a synonym of *B. bengalensis*. We have also noted that *B. scrobatae*, identified by us as a new species, is another synonym of *B. bengalensis* Cam.

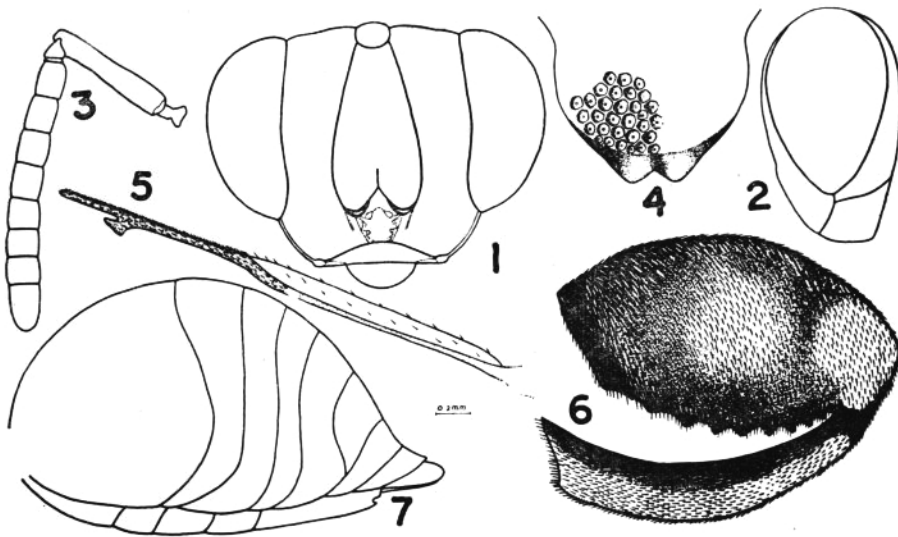
### 30. *Brachymeria bengalensis pulchellae* Joseph *et al.*

(30: Figs. 1 – 7)

1972 : *Brachymeria bengalensis pulchellae* Joseph *et al.*, *Oriental Ins.*, 6 (4): 422–424.

*Female* : Length 4.8 mm. – 5.79 mm. Black; tegulae yellow. Wings rather smoky, veins brownish-black. Fore and mid coxae black; hind coxae reddish-black or sometimes black, fore and mid trochanters

blackish-brown; hind trochanters reddish brown; fore femora brownish-black at basal half, immaculate yellow at apical half; mid femora brownish-black with the apical area immaculate yellow; hind femora reddish or orange-brown, apex with a small immaculate yellow patch; ventral teeth black; fore and mid tibiae immaculate yellow with a small brownish patch at the inner middle region; hind tibiae immaculate yellow with the base dark reddish and having a dark brownish-red band along ventral carina on outer and inner sides; tarsi yellow. Pubescence silvery-white.



30: Figs. 1-7. *Brachymeria bengalensis pulchellae* Joseph et al. (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, forewing venation;  
6, hind femur and tibia; 7, abdomen in lateral view.

**Head** (Fig. 1) a little wider than thorax, one and one-third as wide as long. Surface of head with shallow pits; pits indistinct in the anterior half of frons. Scrobe deep, smooth and shiny; its maximum width a little more than half the interocular space, attaining the front ocellus. Length of scrobe a little more than one and three-fourths its maximum width; parascrobal space about half the maximum width of scrobe. Length of eye (Fig. 1) two and a half times as long as wide. Median ocellus hardly a little larger than lateral. The distance between median and lateral ocelli a little more than one-third the interocellar distance; interocular space about two and a half times

interocellar distance; interocellar distance three and one-fourth times ocellocular distance. Width of clypeus five times its median length. Width of labrum two and two-fifths its median length. Width of ocellar area three-fourths the interocular space; interocellar distance a little more than two and one-third times the maximum diameter of the lateral ocellus. Frons without preorbital carina. Postorbital carina present reaching the genotemporal margin (Fig. 2). Interantennal projection moderately developed; lateral ridges of scrobe faintly produced in front of antennal toruli (Fig. 1); area below scrobe with a median smooth portion (Fig. 1); height of malar space a little more than one-third the height of eye; front genal angle (Fig. 2) slightly acute; hind genal angle nearly rectangular (Fig. 2). Antenna (Fig. 3) fairly stout. Scape not exceeding the front ocellus, longer than segments four to six combined, slightly contracted beyond the middle; pedicel length subequal to its width; fourth and fifth segments equal in length; sixth and seventh segments equal in length; eighth shorter than seventh and longer than ninth; tenth and ninth equal in length; club length twice the length of tenth segment, a little more than one and a half times its own width; segments four to ten slightly increasing in thickness.

*Thorax* provided with large, rounded, reticulate, umbilicate and close pits; interspaces of pits rugulose and narrow. Mesoscutum hardly a little more than one and a half times as wide as long. Scutellum (Fig. 4) almost of equal length and width, fairly high in profile, gently declined posteriorly; apical margin explanate and emarginate (Fig. 4) with thick silvery pubescence. Forewing a little more than two and a half times as long as wide; marginal vein (Fig. 5) three-fifths the submarginal and one-third the stigmal. Hind coxa in most specimens with a distinct tubercle (in some specimens this tubercle is less distinct). its ventral side finely punctured. Hind femur (Fig. 6) one and three-fourths as long as wide; its outer side closely and finely punctate, provided with relatively short pubescence; inner side with lesser pubescence and punctures than outer side and without a protuberance near base; outer ventral margin with 12 teeth (Fig. 6).

*Abdomen* (Fig. 7) a little longer than the pronotum, mesoscutum, and scutellum combined, highest about the middle, a little less than one and three-fourths as long as wide. First tergite shagreened on dorsal side, lateral regions punctured and pubescent. Second tergite with small and close punctures with larger punctures in the basodorsal portions. Sixth tergite with 12–14 transverse rows of punctures, each row with several close pits having silvery pubescence. Ovipositor sheath clearly visible from dorsal side.

**Male :** Length 4.57–5.11 mm. Resembles female in almost all features, except in having: i) no coxal tooth on the inner ventral side of hind coxa; ii) sixth tergite with 6–8 transverse rows of pits; iii) abdomen a trifle shorter than pronotum, mesoscutum, and scutellum combined.

**Holotype** 1 ♀, Coll. No. C. U., 1560 on pin; its antenna and forewing on slide No. 1560a and hind leg on slide No. 1560b; INDIA: New Delhi, I. A. R. I., Coll. M. Ramachandra Rao on 4–xii–1953. **Allotype** 1 ♀, Coll. No. C. U. 1542 on pin; INDIA: New Delhi, I. A. R. I., Coll. H. Khan on vi. 1946; from *Utetheisa pulchella*. **Paratypes** 2 ♂♂ and 3 ♀♀; Coll. No. C. U. 1557 (♂) on pin; INDIA: Coll. K. Single on 21–ix–1937 from *Earias* sp.; Coll. Nos. C. U. 1547 (♂), 1544 (♀) 1536 (♀) and 1531 (♀), all on pins and collection data same as for the Allotype. Types deposited at I. A. R. I. New Delhi, India, except one paratype (No. 1538) which is deposited in the British Museum (Natural History), London.

**Distribution :** India.

**Hosts :** 1) *Sylepta derogata* F. (Fam. Pyralidae) a pest of cotton, bhindi, etc.; (2) *Utetheisa pulchellae* (Fam. Arctiidae) pest of Sannhemp; (3) *Earias* sp. (Fam. Noctuidae) pest of cotton, bhindi, etc.

**Remarks :** This subspecies can be distinguished from *B. bengalensis* Cameron in having: (i) a tooth (not very prominent) on the inner ventral side of hind coxa in female; (ii) the lateral ridges of scrobe only faintly produced in front of the antennal toruli; (iii) first tergite shagreened; (iv) abdomen of female a trifle longer than pronotum, mesoscutum and scutellum combined.

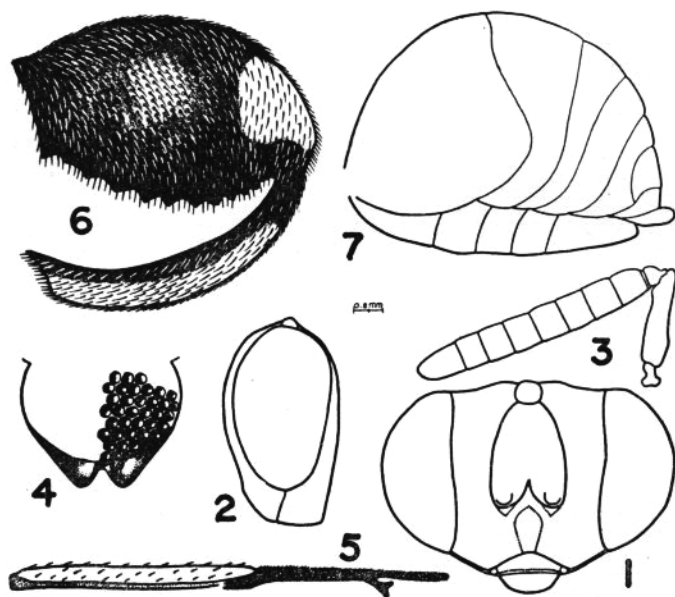
### 31. *Brachymeria amphissa* (31: Figs. 1–7)

- 1846: *Chalcis amphissa*, Walker., *List. Hymen. Brit. Mus.*, **1**, p. 83.
- 1862: *Chalcis responsator*, (Walker), *Trans. Ent. Soc. London*, p. 345–397.
- 1906: *Chalcis responsator* (Cameron), *J. Bombay Nat. Hist. Soc.*, **17**: 94.
- 1909: *Chalcis amphissa* (Walk.), Schmiedeknecht, *Gen. Ins.*, fas. **97**, p. 26.
- 1909: *Chalcis responsator* (Walk.) Schmied., *Gen. Ins.*, fas. **97**, p. 28.
- 1924: *Chalcis responsator* (Husain) *Rep. Proc. Fifth Ent. Meeting Pusa*, p. 35.

1925 : *Chalcis amphissa* (Walk.), Ramakrishna Ayyar, *Spol. Zeyl.*, **XIII**, p. 238.

1925 : *Chalcis responsator* (Walk.), Ramakrishna Ayyar, *Spol. Zeyl.*, **XIII**, p. 238.

*Female* : Length 5.2 mm. Black; tegulae yellow. Coxae blackish-brown. Fore and mid femora dark brownish with the distal ends yellow. Hind femora brownish-red with the tip yellow on outer side, and with a pale blackish patch near the yellow colouration (this blackish colouration on the hind femora is not a constant feature). Fore and mid tibiae yellow. Hind tibiae yellow with the base brownish-red and this colouration extends to the tip of the tibiae through the ventral side. Tarsi yellow with the tip brownish. Pubescence silvery and dense on frons and apex of scutellum.



31 : Figs. 1-7. *Brachymeria amphissa* (Walker) (♀)

1, head in front view; 2, head in lateral view; 3, antenna;

4, scutellum in dorsal view; 5, forewing venation;

6, hind femur and tibia; 7, abdomen in lateral view.

*Head* (Fig. 1) distinctly wider than the width of thorax, a little over one and one-third as wide as its own length; vertex distinctly pitted with the interspaces between the pits rugose. Scrobe deep, smooth and shiny, its maximum width half the interocular space. Length of scrobe a trifle over one and two-fifths its maximum width,

attaining front ocellus. Parascrobal space at its shortest length a little less than half the maximum width of scrobe. Length of eye (Fig. 1) two and one-third its width; median ocellus a little larger than the diameter of the lateral ocellus; the distance between median and lateral ocellus a little less than half the interocellar distance; interocular space about two and two-thirds the interocellar distance; interocellar distance two and three-fifths ocellocular distance. Width of clypeus about four times its median length; width of labrum a little over three times its median length; width of ocellar area a little less than three-fourths the interocular space; interocellar distance a little over two and one-third the maximum diameter of the lateral ocellus. Frons without preorbital carina. Postorbital carina absent. Inter-antennal projection moderately developed. Lateral ridges of scrobe very faintly or not produced in front of the antennal toruli; area below scrobe with a smooth portion in the middle (Fig. 1). Length of malar space a little less than one-fourth the length of eye. Front and hind genal angles nearly rectangular and as in the figure. Antenna (Fig. 3) stout; scape not exceeding the front ocellus, longer than segments four to six combined; pedicel length subequal to its width; ring segment more than five times as wide as long; fourth segment as long as wide; fifth segment a little wider than long and equal to the fourth segment; sixth segment hardly a little shorter than fifth; length of seventh segment equal to that of the fifth; eighth equal in length to sixth; ninth a trifle shorter than eighth and longer than tenth; club a little less than one and a half times as long as wide and a trifle less than twice as long as the tenth segment.

*Thorax* provided with reticulate and umbilicate pits (Fig. 4); interspaces of the pits narrow and rugulose. Mesoscutum a little over one and three-fourths as wide as long; scutellum a little wider than long, moderately high in lateral view, almost perpendicularly declined posteriorly with the apical flange explanate and emarginate (Fig. 4) and provided with dense silvery-white pubescence. Dorsal margin of the lateral face of pronotum slightly interrupted anteriorly. Forewing a little over two and a half times as long as wide; marginal vein (Fig. 5) about three-fifths the submarginal; postmarginal half the marginal and thrice the stigmal. Hind coxa on ventral side distinctly pitted, without an inner tooth. Hind femur (Fig. 6) one and three-fourths as long as wide; its outer side minutely and densely punctate, with a row of 13 black teeth on the outer ventral margin; inner side without a basal tooth.

*Abdomen* (Fig. 7) shorter than pronotum, mesoscutum and scutellum combined; a little less than one and two-fifths as long as its



own height. First tergite smooth dorsally. Second tergite with fine punctures and pubescence on the basal half of the dorsal side and lateral regions; rest of the dorsal side finely microsculptured. Sixth tergite irregularly rugose punctured, punctures not very coarse, in about 8 cross-rows medially with dense pubescence. Ovipositor sheath not visible from above.

*Male*: Length 4.7 mm. Resembles the female in almost all respects. Sixth tergite with about 8 cross-rows of pits as in the female.

*Specimens examined*: 1 ♀, coll. No. C. U. 1025 on pin, collection data unknown. Det. Z. Boucek, 1971. Coll. No. C. U. 1665 from the collections of I. A. R. I., New Delhi. Coll. No. 186 from the collections of Dept. of Zoology, University of Calicut, Kerala.

*Distribution*: India.

*Host*: *Earias*. sp.

*Affinities*: *Brachymeria bengalensis* Cam. seems to be related to *B. amphissa* Walker. But *B. bengalensis* Cam. differs from *B. amphissa* in having the postorbital carina present and the lateral ridges of scrobe distinctly produced in front of the antennal toruli.

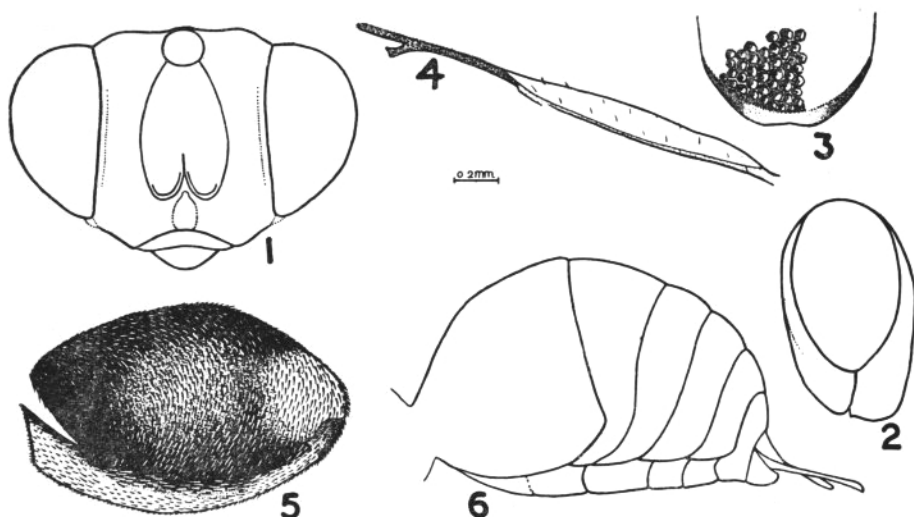
*Remarks*: In consultation with Dr. Boucek we have come to the conclusion that *B. responsator* Walker is synonymous with *B. amphissa* Walker.

### 32. *Brachymeria margaroniae* Joseph *et al.* (32: Figs. 1-6)

*Male*: Length 3.69 mm. Black; tegulae yellow. Coxae, trochanters and femora black except the distal tips of femora which are yellow; tibiae yellow except the base of hind tibiae which are reddish-black extending to the distal region along the ventral margin and with a slight extension in the middle towards the dorsal region; tarsi yellowish. Pubescence moderate and silvery-white.

*Head* (Fig. 1) width equal to that of thorax, about one and a half times its own length; vertex distinctly pitted with the interspaces between the pits rugose. Scrobe deep, smooth and shiny; the maximum width of scrobe a little less than two-thirds the interocular space, attaining the front ocellus. Length of scrobe one and one-third its maximum width; parascrobal space a little more than two-fifths the maximum width of scrobe. Length of eye (Fig. 1) a little less than twice its maximum width; median ocellus a little larger than lateral; the distance between median and lateral ocelli one-third the interocular distance; interocular space a little less than twice the interocular

distance; interocellar distance eight times the ocellocular distance. Width of clypeus six times its median length; width of labrum three



32: Figs. 1-6. *Brachymeria margaroniae* Joseph et al. (♂)

1, head in front view; 2, head in lateral view; 3, scutellum in dorsal view; 4, forewing venation; 5, hind femur and tibia; 6, abdomen in lateral view.

times its median length; width of ocellar area a little over five-sixths the interocular space; interocellar distance three times the maximum diameter of the laral ocellus. Frons with indistinct preorbital carina; postorbital carina absent; area below scrobe with a median raised smooth portion (Fig. 1). Lateral ridges of scrobe not produced in front of the antennal toruli; inter-antennal projection well developed and thin; height of malar space about one-third the height of eye; front genal angle nearly rectangular (Fig. 2); hind genal angle slightly obtuse and rounded off. Antennae not stout, scape not exceeding the front ocellus, longer than segments four to six combined.

*Thorax* provided with reticulate, rounded, umbilicate and close pits (Fig. 3); interspaces between the pits narrow and rugose. Width of mesoscutum one and two-thirds its length; width of scutellum subequal to its length; moderately high in lateral view, obliquely declined posteriorly, apical margin explanate, very slightly emarginate (Fig. 3). Dorsal margin of the lateral face of pronotum interrupted anteriorly. Forewing a little more than two and a half times as long as wide, marginal vein a little less than half the submarginal (Fig. 4); postmarginal a little over one-third the marginal, a little over twice

the stigmal. Hind coxa on dorsal side smooth, its ventral side distinctly pitted and moderately pubescent and without tooth. Hind femur (Fig. 5) a little over one and three-fourths as long as wide; its outer side mat with a row of eleven teeth on the ventral margin; inner side without a basal tooth.

*Abdomen* (Fig. 6) shorter than pronotum, mesoscutum and scutellum combined, a little over one and a half times its own height. First tergite shagreened; second tergite with a single row of pits on the dorso-basal side, rest of the dorsal side of second tergite finely microsculptured; lateral sides with punctures and pubescence. Sixth tergite small and with two transverse rows of faint pits.

*Female*: Length 4–5 mm. Resembles the male in almost all respects. Abdomen longer than pronotum, mesoscutum and scutellum combined, pointed and narrow apically. Sixth tergite with about 5 rows of faint pits and rugose.

*Holotype* 1 ♂, coll. No. C. U. 339a on pin, INDIA: Madras State, Salem, coll. Joy and Sreenivasan on 27. xii. 1969 from pupa of *Margaronia indica*. *Allotype* 1 ♀ (damaged) on pin, INDIA: Kerala State, Calicut University Campus, coll. No. C. U. 339b. Narendran on 11. vi. 1971 from *Margaronia indica*.

*Specimens examined*: 1 ♂, and 1 ♀ on pins, coll. Nos. C. U. 588 and 672, PHILIPPINES: Palawan, N. E. Tinabog, coll. H. Holtmann on 6–7–v. 62. 1 ♀ coll. No. C. U. 367 on pin, VIETNAM, coll. C. M. Yoshimoto on 8–16–xi. 60.

Holotype will be deposited at Indian Agricultural Research Institute, New Delhi. Paratypes are in the Bishop Museum, Honolulu.

*Distribution*: India, Vietnam and Philippines.

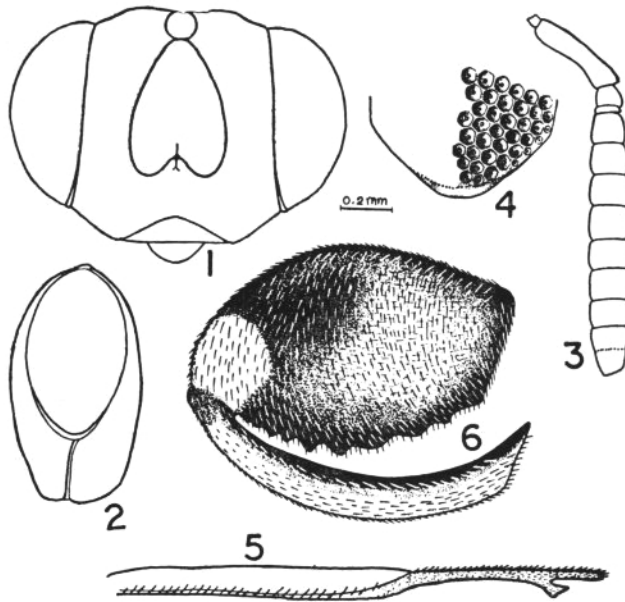
*Hosts*: *Diaphania (Margaronia) indica* (Fam. Pyralidae).

*Affinities*: *Brachymeria jayaraji* Joseph *et al.* resembles this species in many respects but can be separated in having: (i) the vertex faintly pitted; (ii) area below scrobe uniformly punctate; (iii) hind femora often reddish-brown with blackish patches of varying sizes on its outer side.

### 33. *Brachymeria jayaraji* Joseph *et al.* (33: Figs. 1 — 6)

*Female*: Length 3.7 – 4.04 mm. Tegulae pale yellow. Front and mid coxae black; trochanters brownish-black; femora brownish-black except the distal tip which is yellow; tibiae yellow; tarsi yellowish with the distal tip brownish. Hind coxa black with the distal portion brownish-red; trochanter reddish-brown; femur reddish-brown except

the apex which is yellowish and with a pale blackish patch on outer side (this pale blackish patch is absent in some of the paratypes); tibia yellowish with a ventral blackish carina; base of the tibia somewhat brownish; tarsi yellowish with the distal end brownish-black.



33: Figs. 1-6. *Brachymeria jayaraji* Joseph et al. (♀)

- 1, head in front view; 2, head in lateral view;  
3, antenna; 4, scutellum in dorsal view;  
5, forewing venation; 6, hind femur and tibia.

*Head* (Fig. 1) width almost equal to that of thorax, a little over one and one-third as wide as its own length. Surface of head rugose and faintly pitted. Scrobe smooth; length of scrobe slightly less than one and one-third its width; area below scrobe faintly pitted without a distinct triangular region; parascrobal space half the width of scrobe; scrobe occupying a little over half the interocular space, attaining the front ocellus. Length of eye (Fig. 1) a little more than two and a half times its own width; median ocellus slightly larger than lateral; the distance between median and lateral ocelli a little less than half the interocellar distance; interocular space about two and one third the interocellar distance; interocellar distance three and one-third the ocellocular distance. Width of labrum twice its median length. Width of clypeus about three and a half times its median length. Width of ocellar area about three-fourths the interocular space; inter-

ocellar distance two and a half times the maximum diameter of the lateral ocellus. Frons without preorbital carina; postorbital carina present (Fig. 2); inter-antennal projection moderately developed; lateral ridges of scrobe not produced in front of the antennal toruli; height of malar space (Fig. 1) one-third the height of eye; front genal angle slightly acute; hind genal angle obtuse and rounded off. Antenna (Fig. 3) fairly stout; scape not exceeding the front ocellus, almost equal to the length of segments four to six combined, contracted after the middle; pedicel as wide as long; ring segment thrice as wide as long; each of segments four to nine of equal length and longer than segment ten; segment four narrowest of all funicular segments; club length about twice the length of segment ten, one and one-fifth its own width.

*Thorax* provided with reticulate, umbilicate and close pits, interspaces of pits narrow and rugose (Fig. 4); width of mesoscutum a little over one and three-fourths its length; notaulices distinct; scutellum a little wider than long, moderately high in lateral view and gently declined posteriorly, apical margin explanate and entire with pubescence. Forewing a little more than two and one-third as long as wide; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane; marginal vein (Fig. 5) a little longer than half the submarginal; postmarginal a little over one-third the marginal and equal to two and one-third the stigmal. Hind coxa on outer side distinctly punctate. Hind femur length a little less than one and two-thirds its width, outer side reticulated and with pubescence; ventral margin with a row of 11 (varies from 10–13 in the different specimens examined) black teeth (Fig. 6). Teeth 1–3 smaller than 4–8; 9 small; 10 smaller; 11 smallest. Hind tibia longer than hind femur. Hind coxa and femur without an inner tooth.

*Abdomen* length a little less than one and a half times the length of pronotum, mesoscutum and scutellum combined; slightly over one and four-fifths its height. Tergites 1 and 2 with microsculptures. Tergite 6 with 5–6 transverse rows of indistinct punctures.

*Male*: Length 3.13 mm.; distinctly smaller than the female which it resembles in almost all characters.

*Holotype* ♀, coll. No. 215 on pin; antenna and forewing on slide No. 215a and hind leg on slide No. 215b. *Allotype* ♂, coll. No. 213 on pin. INDIA: Madurai, Madras State, Coll. S. Jayaraj from *Pelopidas mathias* F. and *Melanitis ismene* G. from Madurai Agricultural College Farm on x. 1968. *Paratypes* 3 ♀♀ Coll. Nos. 237, 238 and 239 on pins. INDIA: Mysore State, Coll. S. Sivasankara

Sastry and M. Appanna from Tussock caterpillars on vi. 1953 (coll. No. 237) and on 11.1951 (coll. Nos. 238 and 239). Holotypes and Allotypes will be deposited in Indian Agricultural Research Institute, New Delhi. Paratype (No. 217) deposited in U. S. National Museum, Washington. Paratype No. 214 deposited in British Museum (Natural History), London.

*Distribution* : India.

*Hosts* : *Pelopidas mathias* F. (Fam. Hesperidae), *Melanitis ismene* G. (Nymphalidae) & Tussock caterpillars (Lymantriidae).

*Affinities* : *Brachymeria margaroniae* Joseph *et al.* resembles this species closely but can be separated from this species in having: (i) the vertex distinctly pitted and not faintly pitted; (ii) area below scrobe with a small smooth portion; (iii) hind femora black with an apical yellow patch.

*Remarks* : According to Dr. Boucek, *B. jayaraji* is extremely close to the South African *B. lissostoma*. In his opinion *B. jayaraji* is not identical with any species described so far from South East Asia but seems to be very close to *B. persica* (Masi). *B. lymantriae* Joseph *et al.* is a synonym of *B. jayaraji*.

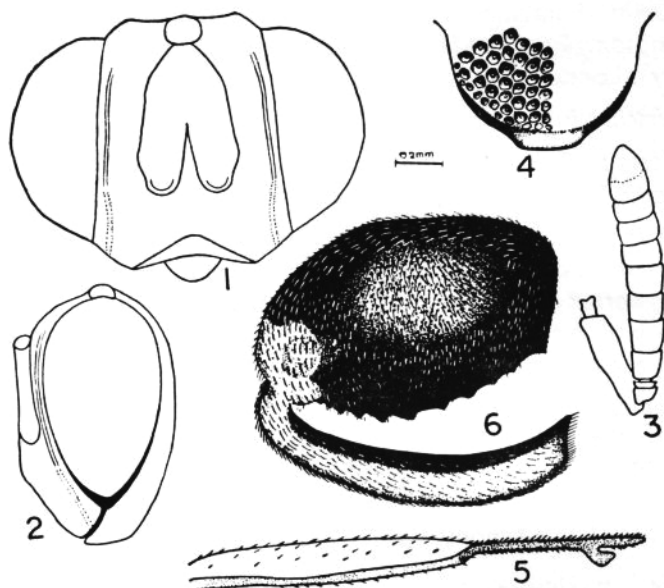
#### **34. *Brachymeria carinata* Joseph *et al.* (34: Figs. 1–6)**

1970: *Brachymeria carinata* Joseph *et al.* *Agri. Res. J. Kerala*, **8** (1): 22–23.

*Female* : Length 4.7 mm. Black; tegulae pale brownish-yellow. In the fore and mid legs, the coxae and trochanters black; femora black except the tips where they are yellow; tibiae yellowish; tarsi dull yellowish. In the hind legs, the coxae and trochanters black; femora black except the tip which is yellow; tibiae and tarsi yellowish. Pubescence whitish and close.

*Head* (Fig. 1) as wide as the thorax, about one and one-third as wide as long; surface of the head with large reticulate and close pits; interspaces of pits rugose. Surface of the scrobe smooth and shiny; length of the scrobe about one and a half times its width. Parascrobal space slightly less than half the width of scrobe. Scrobe deep, occupying about two-thirds the width of interocular space, attaining the front ocellus. Length of the eye about two and a half times its width. Median ocellus larger than lateral ocellus. The distance between median and lateral ocelli is distinctly less than half the interocular distance. Interocular space twice the interocular distance. Clypeus about five times as wide as long. Labrum twice as wide as long. Width of ocellar area a trifle shorter than interocular

space. Interocellar distance slightly over two and a half times the maximum diameter of lateral ocellus. Frons with preorbital carina



34: Figs. 1-6. — *Brachymeria carinata* sp. nov. (♀)

- 1, head in front view; 2, head in lateral view;  
3, antenna; 4, scutellum in dorsal view;  
4, forewing venation; 6, hind femur and tibia.

distinct (Figs. 1 & 2); postorbital carina absent (Fig. 2). Inter-antennal projection very long and reaching almost upto the middle of the length of the scrobe. Lateral ridges of scrobe not produced in front. Area below scrobe without a raised smooth and median portion. Height of malar space about one-fourth the height of eye. Front genal angle acute; hind genal angle slightly obtuse and rounded. Antenna (Fig. 3) fairly thick, increasing in thickness from segments four to ten. Scape not exceeding the front ocellus, distinctly longer than the length of segments four to six combined, contracted after the middle. Length of pedicel equal to its width. Ring segment three times as wide as long. Segment four to ten becoming wider; fourth shorter than fifth and as long as seventh; eighth shorter than seventh; ninth and tenth of equal length and shorter than eighth; club a little more than two times as long as its own width.

*Thorax* (Fig. 4) provided with umbilicate, moderately sized, reticulate, and close pits, each pit provided with a seta; the interspaces

of pits are rugose and narrow. Mesoscutum about one and one-third as wide as its length; notaulices distinct. Scutellum one and one-third as wide as long; high in lateral view, gently declined posteriorly, apical margin slightly explanate and rounded off with sparse pubescence. Forewing about two and three-fourths as long as wide; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane; marginal vein (Fig. 5) slightly less than half the submarginal; postmarginal a little over one-third the marginal, a little over twice the stigmal. The outer side of the hind coxa with large and close punctures and pubescence. Hind femur (Fig. 6) about one and two-thirds as long as wide; its outer side with close punctures and pubescence; ventral basal region without an inner tooth; outer ventral margin with a row of 11 teeth as in figure, the first tooth being the largest and 11th the smallest. Length of hind tibia about equal to the length of hind femur.

*Abdomen* : Abdomen somewhat pointed posteriorly, about one and a half times the length of pronotum, mesoscutum and scutellum combined; highest slightly before the middle; length a little less than twice its height. First tergite large, extending to less than half of the abdomen; surface shiny with small punctures; lateral regions with sparse pubescence. Second tergite with large punctures all over and with pubescence restricted to the dorso-lateral region proximally and to the lateral region distally. Sixth tergite with about six rows of large close shallow punctures and pubescence. Ovipositor sheath projecting posteriorly and visible from above.

*Holotype* 1 ♀, coll. No. 169 on pin; its antenna, forewing and hind leg on slide Nos. 27a, 27b, 27c respectively; INDIA: Medical College, Calicut, Kerala; Coll. Joseph, 8-1-1968. The type will be deposited in Indian Agricultural Research Institute, New Delhi, INDIA.

*Specimens examined* : Coll. No. C. U. 1642 to 1646, from the collections of Indian Agricultural Research Institute, New Delhi; Coll. No. C. U. 695 from the Collections of Bishop Museum Honolulu; Coll. No. C. U. 1232 to 1235 from the collections of Faculty of Entomology, Tamilnadu Agricultural University, Coimbatore.

*Distribution* : India & Vietnam.

*Host* : Hyperparasitic on *Psychid* (Fam: Psychidae) pest of *Pithecolobium* sp.

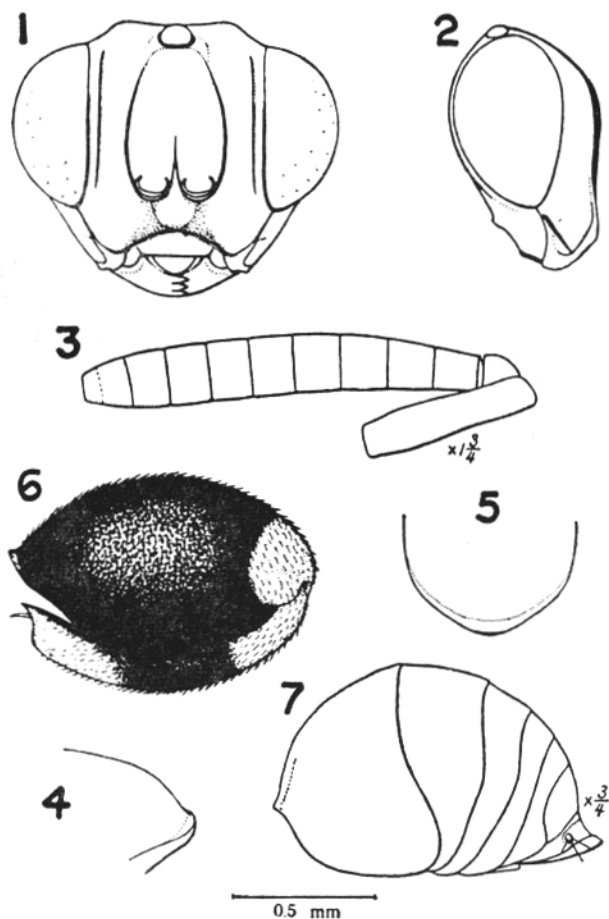
*Affinities* : *Brachymeria shansiensis* Habu (♀) resembles this species closely but differs from it in having the hind tibia yellow with a median reddish-black band and scape not longer than segments four to six combined.



**35. *Brachymeria shansiensis* Habu (35: figs. 1-7)**

1961: *Brachymeria shansiensis* Habu, *Mushi.*, Vol. **35** (ii): 80-82.

*Female*: Length 3.2 mm. Black; tegulae clear yellow with base brownish. Coxae black; fore and mid femora reddish-black, with apex widely yellow; hind femora (Fig. 6) black, rather mat at outer side, with apex yellow, yellow part extending onto inner side; fore and mid tibiae yellow, reddish-brown at median area; hind tibia (Fig. 6)



**35** : Figs. 1-7. — *Brachymeria shansiensis* Habu (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in lateral view; 5, scutellum in dorsal view;  
6, hind femur and tibia; 7, abdomen in lateral view.

yellow at almost basal one-third and apical one-third, reddish-black at median one-third. Pubescence and bristles on body silvery.

*Head* (Fig. 1) a little wider than thorax; surface shallowly pitted, pits smaller and irregular on ventral area of frons, very sparse on ventral area of genae; interspaces of pits finely carinate (faintly on vertex); frons with swollen unpitted area in middle below scrobe; width of ocellar area four-fifths or five-sixths the width of interocular space at level of hind ocelli; interocellar distance two and one-half times as wide as major axis of hind ocelli. Frons with fine preorbital carinae which become faint below compound eyes, faintly depressed on outer side of each antennal socket, fairly depressed along fronto-clypeal suture and near anterior tentorial pits; scrobe deep, occupying more than one-half of interocular space, reaching front ocellus though margins becoming faint near apex; inter-antennal projection distinctly narrow; malar spaces two-fifths as high as compound eyes. Genae without postorbital carina, distinctly depressed at ventral area leaving somewhat swollen area along ventral margin; ventral margin rounded behind front angle; front genal angle almost rectangular though rounded; hind genal angle very obtuse. Antennae (Fig. 3) somewhat stout; scape not reaching front ocellus, as long as segments 4 to 7 combined, weakly contracted before middle; pedicel as long as wide; segments 4 to 7 increasing in width; segment 4 as long as wide; segments 5 to 10 almost equal or slightly decreasing in length; segment 5 slightly wider than long; segment 10 one and two-fifths as wide as long; club twice as long as segment 10, superficially three-segmented.

*Thorax* moderately distinctly pitted on dorsal side, pits relatively shallow, interspaces of pits distinctly narrower than diameter of pits, almost not carinate or faintly carinate in part, with distinct reticulation or striation. Mesoscutum one and one-third times as wide as long; scutellum (Figs. 4 & 5) as long as wide, relatively low and gently declined posteriorly in lateral aspect, apical explanate part not wide, apex rounded. Forewing two and one-third times as long as wide; marginal vein one-half as long as submarginal, base somewhat spaced from apex of submarginal vein; postmarginal a little more than two-fifths as long as marginal, twice as long as stigmal. Hind coxae distinctly densely pubescent-punctate on ventral side, without protuberance on inner ventral side. Hind femur (Fig. 6) a little less than twice as long as wide (excluding ventral teeth); outer side densely finely punctate, somewhat rugose, finely striate (rather mat), inner side with fine dense punctures, but not rugose nor striate (almost shiny); inner ventral side without tooth near base; outer ventral margin with about eleven teeth relatively small.

*Abdomen* (Fig. 7) somewhat pointed posteriorly, longer than pronotum, mesoscutum and scutellum combined, widest before middle, a little narrower than thorax. First tergite finely densely punctate on dorsal side (punctures faint at basal area), finely densely, rather faintly punctate on lateral sides (punctures invisible at basal area), with one small rounded fovea on each side near posterior margin. Second tergite densely, finely and distinctly punctate, with slightly larger bristled punctures on latero-dorsal and dorsal half of lateral sides. Sixth tergite with shallow, compact pits and strong microsculpture. Ovipositor sheath projecting posteriorly, visible from above.

*Male* : Unknown.

*Distribution* : North China and India.

*Hosts* : Unknown.

*Holotype* 1 ♀, v. 11. 1942, Siachitui — Kaolochen Shansi Province, K. Yasumatsu leg. (After Habu).

*Specimens examined* : 1 ♀, coll. No. 1952. INDIA: Coimbatore on 21. 10. 29. Collector unknown.

*Affinities*: According to Habu (loc. cit.) this new species seems to be related to *B. citrea* Steffan from Senegal, West Africa, in colour and many other characteristics, but may be distinguishable by the mesoscutellum rounded at the apex instead of being weakly emarginate, and the hind femora, in lateral aspect, with a rounded dorsal side (with a dorsal side arcuate or somewhat angularly rounded in *B. citrea*). The first tergite of the abdomen of *B. shansiensis* has a rounded fovea on each side near the posterior margin but it is not certain whether this can be considered as a specific character or a mere individual variation.

*Brachymeria carinata* Joseph *et al.* (♀) also seems to be related to *B. shansiensis* Habu in the general colouration and in many other characteristics but differs from it in having the hind tibia completely yellow without a median reddish-black band and the scape distinctly longer than segments four to six combined.

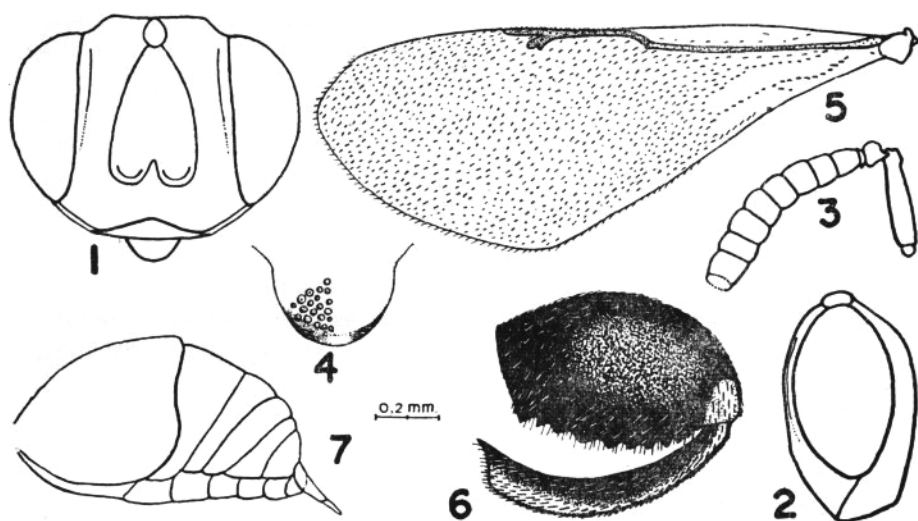
*Remarks* : The above account of *B. shansiensis* Habu is based on the description given by Habu (1961).

**36. *Brachymeria shansiensis vietnamensis*, Joseph *et al.***  
(36: Figs. 1-7)

1972: *Brachymeria shansiensis vietnamensis* Joseph *et al.*,  
*Oriental Ins.*, **6** (3): 348-350.

*Female* : Length 2.10 mm. Black; tegulae yellow with the basal one-third blackish-brown. Coxae, trochanters and femora black

except the distal tips of femora which are yellow. Front and mid tibiae yellow with a small faint pale brownish patch on the median outer aspect; tarsi yellow. Hind tibiae yellow with the ventral region brownish, this brownish colouration extending slightly to the dorsal region in the middle (Fig. 6); tarsi yellow. Pubescence sparse and dirty-white.



36 : Figs. 1-7. — *Brachymeria shansiensis vietnamensis* Joseph et al. (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, forewing; 6, hind femur and tibia;  
7, abdomen in lateral view.

*Head* (Fig. 1) a little wider than the width of thorax, a little less than one and three-fourths as wide as long; surface of head with distinct pits and interspaces of pits and inside of pits rugose. Scrobe deep, smooth and shiny, its maximum width a little more than half the interocular space, attaining the front ocellus; length of scrobe one and two-thirds its maximum width; parascrobal space a little less than half the width of scrobe. Length of eye (Fig. 1) a little more than two and a half times its width; median ocellus larger than lateral; the distance between median and lateral ocelli a little more than one-third the interocular distance; interocular space a little less than two times interocular distance; interocular distance about eight times ocellular distance. Width of clypeus a little less than five times its median length; width of labrum a little more than two times its median length; width of ocellar area hardly a little more than three-fourths the

maximum diameter of the lateral ocellus. Frons with faint preorbital carina which becomes indistinct near the malar ridge (Fig. 1); post-orbital carina absent; area below scrobe with small pits and the interspaces of pits smooth and shiny in the median region; lateral ridges of scrobe not produced in front of the antennal toruli; inter-antennal projection short; height of malar space about one-third (Fig. 1) the height of eye; front genal angle slightly acute, hind genal angle slightly obtuse. Antenna (Fig. 3) not stout; scape not exceeding the front ocellus, longer than segments four to six combined and subequal to segments four, five, six and seven combined, contracted after the middle; pedicel as long as wide; ring segment about four times as wide as long; fourth segment longer than fifth and subequal to sixth segment; segments six to nine subequal in length; segment ten shorter than nine; segment four to ten gradually increasing in thickness.

*Thorax* provided with small, rounded, reticulate, umbilicate and close pits (Fig. 4); interspaces of pits narrow and rugose. Mesoscutum a little over one and two-thirds as wide as long; scutellum length subequal to its width, moderately high in lateral view, gently declined posteriorly, apical margin explanate and rounded off. Forewing (Fig. 5) length a little more than two and a half times its width; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane. Marginal vein about half the submarginal; post-marginal a little less than half the marginal; about twice the stigmal. Hind coxa on ventral side finely punctured, without tooth; hind femur (Fig. 6) one and four-fifths as long as wide, outer side reticulate and mat with faint almost invisible punctures; ventral margin with a row of eleven teeth (Fig. 6); inner side of hind femur without a basal tooth.

*Abdomen* (Fig. 7) length a little less than that of the pronotum, mesoscutum and scutellum combined and equal to three-fourths its own height, highest about the middle. First and second tergites finely and densely pitted with pubescence on the sides. Sixth tergite with one or two rows of shallow pits, the interspaces between the pits being rugulose.

*Holotype* ♀, Coll. No. C. U. 710 on pin, its antenna and forewing on slide No. 710a and hind femur on slide No. 710b; VIETNAM: N. W. of Phan Rang, Coll. C. M. YOSHIMOTO on 8-16. ix, 1960. Types deposited in Bishop Museum, Honolulu.

*Distribution*: Vietnam.

*Hosts*: Unknown.

*Remarks*: *B. shansiensis* described by Habu in 1961, can be distinguished from this subspecies in having: (i) area below scrobe

with smooth swollen portion in the middle (in the subspecies no such character is found); (ii) hind tibia yellow with a median reddish-black band (in the subspecies the colouration is different); (iii) the first tergite of the abdomen has a rounded fovea on each side (which is absent in the subspecies).

**37. *Brachymeria hime* Habu (37: Figs. 1-9)**

1960: *Brachymeria hime* Habu, *Bull. Nat. Inst. Sci., Ser. C. No. 11*, p. 199-201.

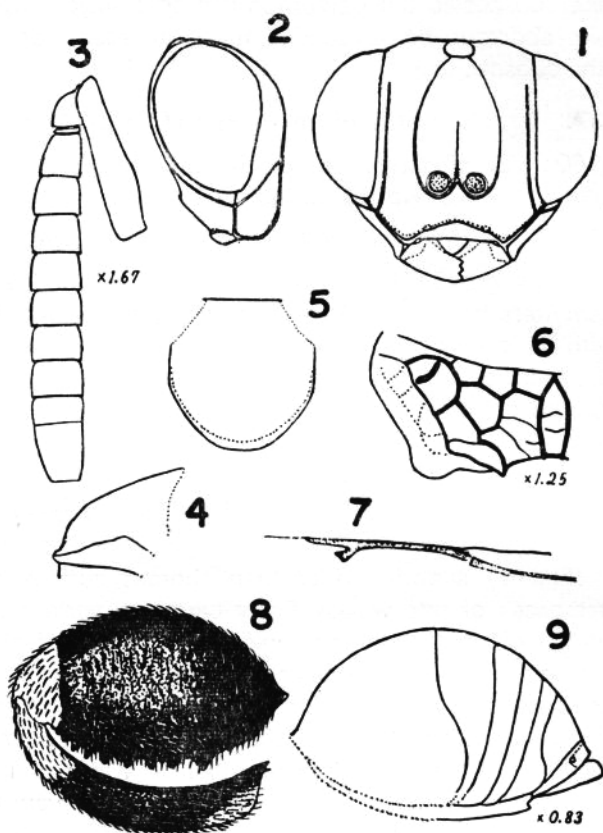
1962: *Brachymeria hime* Habu, *Fauna Japonica*, p. 58-61.

*Female*: Length 3.5 mm. Black; tegulae clear yellow. Coxae black; trochanters brown; femora black (slightly brownish in fore femora) with yellow ring at apex. Fore tibiae yellow at basal and apical parts, blackish at median area; basal and apical yellow parts narrowly united at dorsal side. Mid tibiae black, with narrow basal and rather wide apical areas yellow. Hind tibiae (Fig. 8) black, with basal area widely yellow; dorso-apical area brownish yellow, ventro-apical area black. Pubescence and bristles on body silvery or silvery grey.

*Head* (Fig. 1) slightly wider than thorax; surface shallowly pitted, interspaces of pits weakly finely carinate; surface in scrobe smooth though distinctly striate at apical area; width of ocellar area three-fourths as wide as interocular space at level of hind ocelli; interocellar space two and one-third times as wide as major axis of hind ocelli. Frons with distinct preorbital carinae; scrobe moderately deep, occupying a little more than one-half of width of interocular space, reaching front ocellus; inter-antennal projection very thin; area below scrobe rather low, uniformly punctate and impressed; height of malar space a little more than one-third the height of compound eyes; postorbital carina distinct, reaching posterior margin of genotemporal regions; front genal angle almost rectangular, hind angle obtuse, widely rounded. Antennae (Fig. 3) not stout; scape relatively shorter, distinctly not reaching the front ocellus at apex, a little longer than segments 4 to 6 combined, somewhat dilated at basal one-third; pedicel a little longer than wide; ring segment fairly short; segments 4 to 7 slightly increasing in width; segment 4 as long as wide; segment 5 a little shorter than segment 4; segments 5 to 10 almost equal in length; club more than twice as long as segment 10.

*Thorax* densely pitted on dorsal side, pits rather shallow, interspaces of pits fully narrow, but barely carinate, with evident microsculpture. Mesoscutum one and one-third times as wide as long; scutellum (Figs. 4 & 5) relatively low in lateral view, almost flat at

basal two-thirds, moderately declined at apical part, apical explanate area narrow, apex completely rounded. Propodeum (Fig. 6) strongly



37 : Figs. 1-9. — *Brachymeria hime* Habu (♀)

1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in lateral view; 5, scutellum in dorsal view; 6, propodeum;  
7, forewing venation; 8, hind femur and tibia; 9, abdomen in lateral view.

declined posteriorly, without tooth at lateral sides. Forewing two and one-half as long as wide, marginal vein (Fig. 7) interrupted from submarginal, less than one-half as long as submarginal; postmarginal vein one-third as long as marginal and twice as long as stigmal. Hind coxae distinctly densely punctate and pubescent on ventral side, without protuberance on inner ventral side. Hind femur (Fig. 8) slightly more than one and one-half times as long as wide; outer side densely finely punctate and distinctly reticulate (so rather mat), densely pubescent; inner side minutely but slightly less densely

punctate and pubescent, not reticulate; tooth on ventro-inner side near base indistinct; outer ventral margin with ten teeth.

*Abdomen* (Fig. 9) rather pointed posteriorly, slightly longer than the length of pronotum, mesoscutum and scutellum combined, widest at middle, six-sevenths as wide as thorax. First tergite smooth. Second tergite with a few small punctures on baso-dorsal area, with dense minute rather faint punctures and some bristles on latero-dorsal areas, smooth though with rather faint microsculpture on medio-dorsal area, minutely but rather distinctly punctate and rather densely bristled at dorso-lateral areas. Sixth tergite vestigially pitted, with distinct microsculpture. Ovipositor sheath visible from above.

*Type* : 1 ♀, without indication of locality and date, K. Sato reared from pupa of the Oriental fruit moth in Japan.

*Specimens examined* : Coll. Nos. 453, 586, from the collections of Bishop Museum, Honolulu. Coll. Nos. 1444 to 1462 from the collections of Indian Agricultural Research Institute, New Delhi.

*Distribution* : India, Nepal, Hong Kong, Philippines, Taiwan, Vietnam & Japan.

*Host* : *Grapholitha molesta* Busck (Lepidoptera, Eucosmidae).

*Affinities* : *B. secundaria* (Ruschka) resembles *B. hime* but *B. hime* can be distinguished from *B. secundaria* by the features given in the affinities given under *B. secundaria*.

*B. longiscaposa* and *B. wiebesina* also resemble *B. hime* but *B. wiebesina* differs from *B. hime* in having: (i) the scrobe which does not reach the front ocellus; (ii) apex of scutellum slightly emarginate; (iii) length of scape not exceeding the length of segments four to six combined (♀); (iv) the yellow patch on hind tibia being distinctly smaller; (v) a different shape of the abdomen (♀).

*B. longiscaposa* differs from *B. hime* in having: (i) the scrobe not reaching the front ocellus; (ii) scape longer than segments four to seven combined (♀); (iii) area below scrobe with a smooth median portion.

*Remarks* : The above account is based on the description given by Habu (1960).

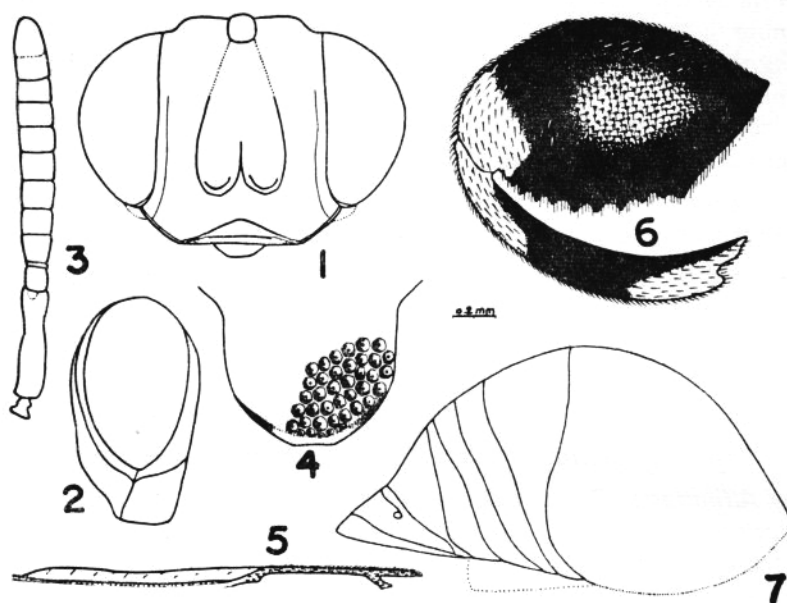
### **38. *Brachymeria hime attevae* Joseph et al. (38: Figs. 1-7)**

1972: *Brachymeria hime attevae* Joseph et al., *Indian Forester*, **98** (9): 556-558.

*Female* : Length 3.98mm. Black; tegulae clear yellow, coxae black; trochanters brownish-black; femora black with yellow colour-



ation at apex; fore tibiae yellow with a pale blackish colouration on the inner middle region; mid tibiae yellow with a pale blackish colouration in the middle; hind tibiae yellow with a median blackish band (Fig. 6). Pubescence on body moderate and silvery or silvery grey. Mandibles brownish apically.



38 : Figs. 1-7. — *Brachymeria hime attevae* Joseph *et al.* (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, forewing venation;  
6, hind femur and tibia; 7, abdomen in lateral view.

*Head* (Fig. 1) width subequal to the width of thorax, about one and one-third as wide as its own length. Vertex pitted distinctly and shallowly; interspaces between the pits rugose. Scrobes deep, smooth and shiny. The maximum width of scrobe a little more than half the interocular space attaining the front ocellus; length of scrobe a little over one and two-fifths its maximum width; parascrobal space a little over two-fifths the maximum width of scrobe. Length of eye (Fig. 1) a little over two times its width; median ocellus a little larger than lateral; the distance between median and lateral ocelli a little over one-third the interocellar distance; interocular space about two and one-fifth the interocellar distance; interocellar distance a little over five times ocellocular distance. Width of clypeus about six times its median length; width of labrum four times its median length; width

of ocellar area five-sixths the interocular space; interocellar distance about two and a half times the maximum diameter of the lateral ocellus. Frons with distinct preorbital carina (Fig. 1); postorbital carina (Fig. 2) present, reaching the genotemporal margin. Area below scrobe rather low, without a smooth median portion; lateral ridges of scrobe not produced in front of the antennal toruli; inter-antennal projection thin. Height of malar space (Fig. 1) a little over one-third the height of eye; front genal angle nearly rectangular (Fig. 2); hind genal angle slightly obtuse (Fig. 2). Right mandible with three teeth; left mandible with two teeth. Antennae (Fig. 3) not stout; scape relatively shorter, hardly reaching the front ocellus, a little longer than segments four to six combined, dilated as in figure; pedicel a little longer than wide; ring segment short; club twice as long as the tenth segment and a little less than twice its own width.

*Thorax* provided with rounded, reticulate, umbilicate and close pits (Fig. 4); interspaces between the pits narrow and rugose. Mesoscutum a little over one and five-sixths as wide as long; scutellum moderately high at base, moderately declined towards apical part, apical flange narrow and explanate, entire. Dorsal margin of the lateral face of pronotum complete and not interrupted anteriorly. Forewing a little less than two and three-fourths as long as wide; marginal vein (Fig. 5) half the submarginal and interrupted from the submarginal; postmarginal one-third the marginal and equal to twice the stigmal. Hind coxae on ventral side densely and shallowly pitted with pubescence, without an inner tooth; dorsal side smooth. Hind femur (Fig. 6) a little more than one and two-thirds as long as wide; outer side densely punctate, reticulate and rather mat with pubescence; inner side minutely and less densely punctate and pubescent, not reticulate and without a basal tooth; outer ventral margin with a row of twelve black teeth.

*Abdomen* (Fig. 7) rather pointed posteriorly, longer than pronotum, mesoscutum and scutellum combined, about one and a half times its own height. First tergite smooth. Second tergite with a few small punctures on baso-dorsal area, with dense punctures and pubescence on sides, smooth though with rather faint microsculptures on rest of the dorsal area. Sixth tergite with about 5-7 transverse rows of very faint shallow pits; interspaces between the pits and inside of the pits rugose. Ovipositer sheath well visible from above.

*Male*: Length 3.5 mm; resembles the female in almost all features except in having: 1) the abdomen shorter than pronotum, mesoscutum and scutellum combined; 2) sixth tergite with three

transverse rows of pits, pits somewhat more distinct in male than in the female.

*Holotype* 1 ♀, coll. No. C. U. 1688, its antenna and forewing on slide Nos. 1688a and 1688b respectively; hind leg on slide No. 1688c; INDIA: Collector unknown, on 18.3.1957, from *Atteva fabriciella* on *Ailanthus excelsa*. *Allotype* 1 ♂, coll. No. C. U. 1687 on pin; INDIA: Neepa Nagar, Collector unknown, on 10.1.1958 from *Atteva fabriciella* on *Ailanthus excelsa*. *Paratypes* 2 ♂♂ and 2 ♀♀ on pins, coll. No. C. U. 1689, collection data same as for the Holotype. Apart from these, about 2,000 specimens of this species with the same collection data have been examined by the authors. Holotypes and Allotypes deposited at Forest Research Institute, Dehra Dun, India. Paratype numbers 1717 and 1934 are deposited in U. S. National Museum and British Museum (Natural History) London respectively.

*Distribution*: India.

*Hosts*: 1) *Atteva fabriciella* Swed. (Fam. Yponomeutidae) defoliator of *Ailanthus excelsa*; (2) *Hapalia machaeralis* Walk. (Fam. Pyralidae), a pest of *Tectona grandis*; (3) *Nephantis serinopa* M. pupa.

*Remarks*: This subspecies and *B. hime* Habu closely resemble each other except that this subspecies has the hind femora and tibiae more prominently yellow at the apical parts. Further, the frons has denser pubescence and the fifth segment of the hind tarsi is three times as long as wide (twice in *B. hime*).

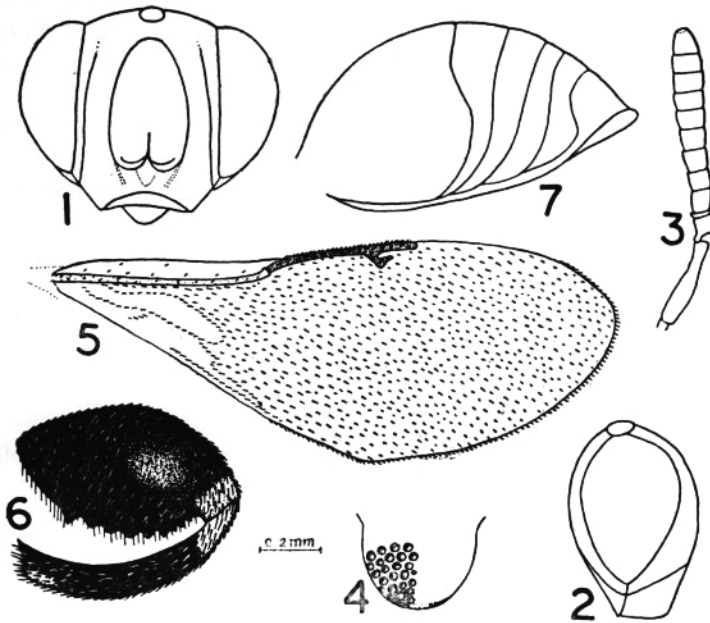
### 39. *Brachymeria longiscaposa*, Joseph *et al.* (39: Figs. 1-7)

1972: *Brachymeria longiscaposa* Joseph *et al.*, *Oriental Ins.*, **6** (3): 343-345

*Female*: Length 2.13 mm. Black; tegulae brownish-yellow. Coxae, trochanters and femora black except the distal ends of femora which are yellow; tibiae black with the base and apex yellow, tarsi pale yellow. Pubescence moderate and whitish.

*Head* (Fig. 1) width equal to that of thorax, about one and three-fourths its own length; vertex shallowly pitted with the interspaces and inside of pits rugose. Scrobe deep, smooth and shiny, its maximum width a little less than two-thirds the interocular space; length of scrobe a little over one and a half its maximum width, not reaching the front ocellus; parascrobal space a little less than half the width of scrobe. Length of eye (Fig. 1) hardly a little over two and three-fourths its width; median ocellus equal to the diameter of lateral; the distance between median and lateral ocelli three-fifths the interocellar distance; interocular space a little less than three times

the interocellar distance, a little more than three times ocellocular distance. Width of clypeus about six times its median length; width of labrum a little over two times its median length; width of ocellar



39 : Figs. 1-7. — *Brachymeria longiscaposa* Joseph *et al.* (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, forewing; 6, hind femur and tibia;  
7, abdomen in lateral view.

area a little over three-fourths the interocular space; interocellar distance one and two-thirds the maximum diameter of lateral ocellus. Frons with distinct preorbital carinae (Fig. 1); postorbital carinae present (Fig. 2), reaching the genotemporal margin; inter-antennal projection long and narrow; lateral ridges of scrobe faintly produced in front of the antennal toruli; area below scrobe with a small smooth portion in the middle; height of malar space (Fig. 1) one-third the height of eye; front genal angle nearly rectangular; hind genal angle slightly obtuse. Antenna not stout (Fig. 3); scape not exceeding the front ocellus, a little longer than segments four to seven combined, a little dilated near the base; pedicel length one and three-fourths its width; ring segment about five times as wide as long; fourth segment slightly longer than fifth; segment six and seven of equal length and longer than segment five; segment eight and nine subequal in length

and shorter than seventh; width of funicular segments slightly increasing towards apex.

*Thorax* provided with rounded, reticulate, umbilicate and close pits (Fig. 4), the interspaces of pits being narrow with microsculptures; mesoscutum a little less than two times as wide as long. Scutellum with length subequal to its width, relatively low in lateral view and moderately declined posteriorly, apical part narrowly explanate, completely rounded. Forewing (Fig. 5) about two and a half times as long as wide; marginal vein (Fig. 5) hardly a little over half the submarginal; postmarginal a little over one-third the marginal, and a little more than twice the stigmal. Hind coxa without tooth, with punctures and pubescence on ventral side, dorsal side smooth. Hind femur (Fig. 6) length a little less than two times its width; its outer side mat, moderately pubescent; outer ventral margin with a row of nine black teeth; inner side without a basal tooth. Hind tibia longer than hind femur.

*Abdomen* (Fig. 7) rather pointed posteriorly, longer than pronotum, mesoscutum and scutellum combined, widest about the middle, about twice as long as wide. First tergite smooth and shiny. Second tergite smooth and shiny with punctures and pubescence on sides and a single row of faint punctures on the baso-dorsal part which becomes more or less indistinct in the middle. Sixth tergite faintly pitted and rugose. Ovipositor sheath visible from above.

*Male*: Length 1.93 mm. Resembles the female in all respects except that the length of the abdomen is almost equal to or a little less than the length of its own thorax. Sixth tergite faintly pitted and rugose.

*Holotype* 1 ♀, Coll. No. 471 on pin, its antenna and forewing on slide No. 471a and hind leg on slide No. 471b; TAIWAN: Taipei Coll. N. L. H. Krauss on May 1958. *Allotype* 1 ♂, Coll. No. C. U. 362 ♂ on pin; VIETNAM: Coll. C. M. Yoshimoto on 8–19. vii. 1960. *Paratype* 1 ♂, Coll. No. C. U. 359 on pin; VIETNAM: Fyan (1200 m.) Coll. N. R. Spencer, between 11. vii–9. viii. 1961. Types deposited in Bishop Museum, Honolulu, except the paratype No. 359 which is deposited in the U. S. National Museum, Washington.

*Distribution*: Taiwan and Vietnam.

*Hosts*: Unknown.

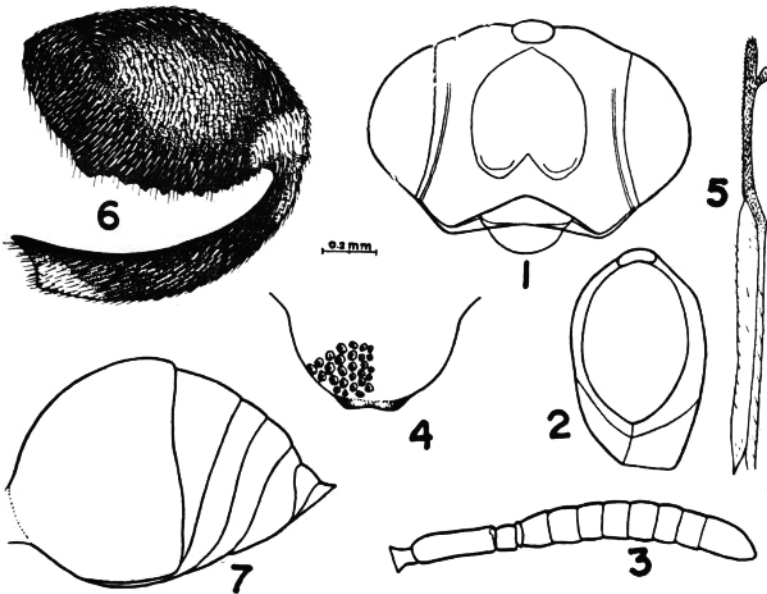
*Affinities*: *B. wiebesina* Joseph *et al.* resembles this species very closely but differs from it in having the scape (♀) as long as segments 4–6 combined and area below scrobe not smooth but with pits.

*B. hime* Habu (1960) also resembles *B. longiscaposa* but differs from it in having: i) the scrobe reaching the front ocellus; ii) scape (♀) not longer than segments four to six combined; iii) area below scrobe uniformly punctate.

*B. secundaria* (Ruschka) also resembles *B. longiscaposa* but differs from it in having the preorbital carina absent or faint, scape shorter than segments four to seven combined (♀), scutellum high in lateral view, distinctly declined posteriorly.

**40. *Brachymeria wiebesina*, Joseph *et al.* (40: Figs. 1-7)**

*Female*: Length 2.70 mm. Black; tegulae dull yellow; antenna blackish-red or sometimes brownish-black. Coxae, trochanters and femora black except the tips of femora which are yellow. Front tibia yellow with a pale brownish colouration in the middle; tarsi pale yellow. Mid tibia yellow with a brownish-black colouration in the middle; tarsi pale yellow. Hind tibia pale blackish-brown with a yellowish patch at the tip and at the base; tarsi pale yellow. Pubescence moderate and dirty-white.



40 : Figs. 1-7. — *Brachymeria wiebesina* Joseph *et al.* (♀)

1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, forewing venation; 6, hind femur and tibia;  
7, abdomen in lateral view.

*Head* (Fig. 1) almost as wide as the width of thorax, a little less than one and a half times its own length. Surface of head only faintly pitted, interspaces of pits and inside of pits rugulose. Scrobe deep, smooth, and shiny, the maximum width of scrobe a little less than two-thirds the interocular space, not reaching the front ocellus. Length of scrobe a little more than its width; parascrobal space a little less than one-third the width of scrobe. Length of eye (Fig. 1) two and one-fourth its width; median ocellus slightly larger than lateral; the distance between median and lateral ocelli hardly a little more than one-third the interocellar distance; interocular space two and one-third interocellar distance; interocellar distance three times ocellocular distance. Width of clypeus two and one-fourth its median length; width of labrum a little less than three times its median length; width of ocellar area a little less than three-fourths the interocular space; interocellar distance three times the median diameter of lateral ocellus. Preorbital and postorbital carinae present and well-developed; area below scrobe not smooth but with pits; inter-antennal projection short; lateral ridges of scrobe not produced in front of the antennal toruli; height of malar space (Fig. 1) a little more than one-third the height of eye. Front genal angle slightly acute; hind genal angle almost rectangular (Fig. 3). Antenna thin (Fig. 3); scape not exceeding the front ocellus, as long as segments four to six combined, slightly contracted after the middle; pedicel hardly a little wider than long; ring-segment about four times as wide as long; fourth and fifth segments almost of equal length; sixth and seventh of equal length and shorter than fifth; eighth hardly a little longer than seventh; ninth shorter than eighth and longer than tenth; segments four to nine gradually increasing in thickness; club a little more than twice the length of tenth segment, a little over one and a half times its own width.

*Thorax* with small, rounded, reticulate, umbilicate and close (Fig. 4) pits; interspaces of pits rugose and narrow. Mesoscutum a little less than one and a half times as wide as long; scutellum a little wider than long, relatively low in lateral view, rather gently declined posteriorly, its apical part explanate and very slightly emarginate with sparse pubescence. Forewing about two and a half times its width; pubescence sparse in the basal one-fourth and dense in the rest of the wing membrane; marginal vein (Fig. 5) a little more than half the submarginal; postmarginal about one-third the marginal and about twice the stigmal. Hind coxa on outer side with distinct punctures and pubescence; hind femur (Fig. 6) a little more than two and a half times its own width; its outer side reticulate with very minute punctures, densely pubescent; inner side with less pubescence than the

outer side and without a basal tooth; outer ventral margin with a row of thirteen black teeth (Fig. 6).

*Abdomen* (Fig. 7) hardly a little longer than pronotum, meso-scutum and scutellum combined, highest about the middle, about one and a half times its own width. First tergite smooth and shiny with very faint, minute, sparse punctures on the median area posteriorly. Second tergite broad, smooth and shiny with very faint, sparse punctures on the dorsolateral areas posteriorly. Sixth tergite with three transverse rows of very faint pits, the proximal row with about fifteen pits, middle row with about nine or ten pits; interspaces between the pits and inside of pits rugulose. Ovipositor sheath clearly visible from above.

*Male*: Length 2.62–2.67 mm. Resembles the female in almost all respects. Sixth abdominal tergite with three transverse rows of very faint pits, the proximal row with about fifteen pits, middle row with about twelve pits, the distal row with about eight or nine pits; interspaces of pits and inside of pits rugulose.

*Holotype* ♀, Coll. No. C. U. 420 on pin, its antenna and forewing on slide No. 420a and hind leg on slide No. 420b. B. BORNEO: Tawan, Quoin Hill, Coll. Holtmann, on 15–20.vii.1962. *Allotypes* 3 ♂♂, Coll. No. 687, 690 and 704 on pins, VIETNAM, Coll. N. R. Spencer on 11.vii.1961. Types deposited in Bishop Museum, Honolulu.

*Specimens examined*: Coll. No. C. U. 601, 666, 681, 684 from the collections of Bishop Museum, Honolulu. Coll. No. 1666 from the collections of Indian Agricultural Research Institute, New Delhi.

*Distribution*: British Borneo, Vietnam, Thailand, Philippines, Singapore and India.

*Hosts*: Sweet potato beetle (Fam: Chrysomelidae).

*Affinities*: This species seems to be allied to *B. hime* Habu in having: (i) the frons with preorbital and postorbital carinae; (ii) the pits on the thorax being close; (iii) almost similar colouration. But *Brachymeria hime* Habu differs from this species in having the following features: (i) scrobe reaches the front ocellus; (ii) apex of scutellum completely rounded; (iii) length of scape in ♀ exceeding the combined length of segments four to six; (iv) the yellow patch on hind tibia is distinctly wider in *B. hime*; (v) in the difference in the shape of the abdomen. *B. longiscaposa* Joseph *et al.* also resembles this species but differs from it in having the scape in female distinctly longer than segments four to seven combined and the area below scrobe with a median smooth portion.



*B. secundaria* (Ruschka) also resembles this species in the colouration and in the nature of the scrobe which does not reach the front ocellus. But *B. wiebesina* differs from it in having a well defined distinct preorbital carina, apex of scutellum slightly emarginate and scutellum relatively low in lateral view.

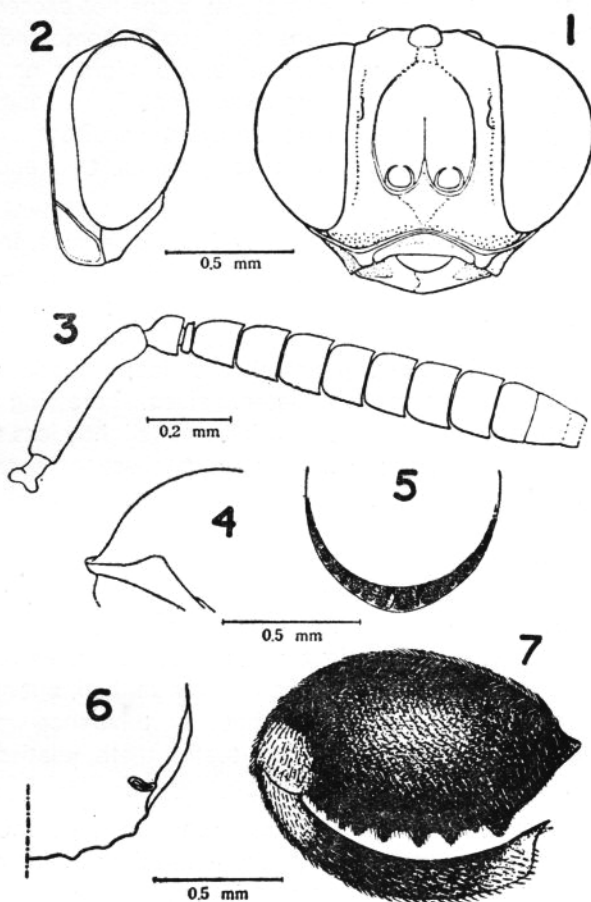
**41. *Brachymeria secundaria* (Ruschka) (41: Figs. 1-7)**

- 1922: *Chalcis secundaria* Ruschka, *Konowia*, **1**: 223, 227-228.
- 1923: *Chalcis secundaria* Mercet, *Rev. Fitopat.*, **1**: 15, 18.
- 1929: *Brachymeria tauriensis* Masi, *Boll. Soc. Ent. Ital.*, **61**: 26-28.
- 1950: *Brachymeria secundaria* forma *tauriensis* Masi, *ibid.*: 37, 46, Fig. 3.
- 1950: *Brachymeria secundaria* Masi, *Eos, tomo extraord.*: 37, 46.
- 1951: *Brachymeria secundaria* Boucek, *Acta. Ent. Mus. Nat. Pragae*, **27**, suppl. 1: 19, 20, 24.
- 1952: *Brachymeria secundaria* Nikol'skaya, *Opred. Faune SSSR*, **44**: 88.
- 1952: *Brachymeria tauriensis* Nikol'skaya, *ibid.* 88-89.
- 1960: *Brachymeria secundaria* Habu, *Bull. Nat. Inst. Agr. Sci.*, Ser. C, No. 11, pp. 195-198.
- 1962: *Brachymeria secundaria* Habu, *Fauna Japonica*, pp. 56-58.

*Female*: Length 3.6 mm. Black; tegulae yellow, with base dark reddish-brown. Coxae and trochanters black, shiny, hind trochanters faintly reddish; fore and mid femora dark reddish-brown, with yellow apex (base slightly yellowish); hind femora (Fig. 7) black, rather shiny, apex yellow, very slightly brownish; fore tibiae dark reddish-brown with apex, base and outer side pale yellow; mid tibiae blackish-reddish-brown, with apex and base whitish-yellow; hind tibiae (Fig. 7) black, slightly reddish, base and apex yellow but partially somewhat brownish. Pubescence and bristles on body silvery-white.

*Head* (Fig. 1) slightly wider than thorax; surface weakly pitted on dorsal side, somewhat distinctly on dorsofront area, not pitted but minutely punctate on area below scrobe (without punctures or pubescence or microsculpture at median part), and on genae; interspaces of pits faintly carinate on dorsal side, somewhat distinctly carinate

on dorsofront area. Surface in scrobe very shiny, smooth, without microsculpture or wrinkles; width of ocellar area five-sixths as wide as interocular space at level of hind ocelli, interocellar distance slightly



41: Figs. 1-7. — *Brachymeria secundaria* (Ruska) (♀)  
 1, head in front view; 2, head in lateral view; 3, antenna;  
 4, scutellum in lateral view; 5, scutellum in dorsal view;  
 6; propodeum; 7; hind femur and tibia.

more than twice as wide as major axis of hind ocelli; frons without preorbital carinae; scrobe deep, wide, occupying two-thirds of interocular space, not reaching front ocellus; inter-antennal projection triangular; area below scrobe relatively low, almost flat though somewhat swollen at middle; height of malar spaces one-fourth as high as

compound eyes; postorbital carina distinct throughout, reaching posterior margin of genotemporal regions; front genal angle protrudent though somewhat rounded, hind angle fairly obtuse, rounded.

Antennae (Fig. 3) not distinctly stout; scape not exceeding front ocellus, slightly shorter than segments 4 to 7 combined; pedicel almost as long as wide; segments of funicle slightly increasing in width apically; segment 4 as long as segment 5, as long as wide; segment 5 slightly wider than long; segment 6 slightly shorter than segment 5; segments 6 to 10 equal in length; club two and one-half times as long as segment 10.

*Thorax* moderately and densely pitted on dorsal side, interspaces of pits narrow, weakly carinate, with distinct microsculpture. Mesoscutum one and one-ninth times as wide as long; scutellum (Figs. 4 & 5) high, distinctly declined posteriorly, apical part narrowly explanate, apex not emarginate but completely rounded; propodeum (Fig. 6) almost vertical, without tooth at lateral sides. Forewing two and one-third times as long as wide; marginal vein slightly less than one-half as long as submarginal; postmarginal two-sevenths as long as marginal, two and one-half times as long as stigmal. Hind coxae strongly punctate and rather densely pubescent at ventral side, without tubercle at inner ventral side; hind femora (Fig. 7) one and three-fourths as long as wide, outer side faintly punctate, but somewhat distinctly rugose (so surface rather rough), densely pubescent, inner side minutely, rather distinctly punctate, punctures and pubescence fairly denser on dorsal half than on ventral half, but not rugose (so surface of inner side shiny), without protuberance near base; outer ventral margin with about ten teeth, teeth relatively larger, first tooth largest.

*Abdomen* oval, almost as long as pronotum, mesoscutum and scutellum combined, widest slightly before middle, as wide as thorax. First tergite smooth. Second tergite minutely and densely punctate, latero-dorsal parts with some bristles, lateral parts rather distinctly punctate and bristled on dorsal half. Ovipositor sheath visible from above.

*Male*: Length 2.4-2.8 mm. Tegulae dark brown or pale yellow with dark brown base. Antennae with trichoid sensillae on ventral side of funicle.

*Specimens examined*: Coll. Nos. C. U. 599 & 659 from Bishop Museum, Honolulu and coll. Nos. 1071 to 1074 from the Faculty of Entomology, Tamilnadu Agricultural University, Coimbatore, India.

*Distribution*: India, Philippines, Japan and Europe.

**Hosts:** This is a parasite of some Hymenoptera parasitic on Lepidoptera: *Rhogas* sp. (Braconidae) parasitic on *Pontia daplidice* Linne. (Pieridae) and *Meteorus rubens* Nees (Braconidae) (after Ruschka, 1922); *Anilastus*? (Ichneumonidae) (after Masi, 1950); Braconidae (after Boucek, 1951); *Rhogas*, *Meteorus*, and *Anilastus* (after Nikol'skaya, 1952); *Meteorus* sp. in Japan.

Besides them, Ruschka (1922) records *Euproctis chrysorrhoea* Linne. (Lepidoptera, Lymantriidae) and Mercet (1923) notes *Orgyia guadarriamensis* Staudinger (Lymantriidae) as hosts, but they consider that *B. secundaria* is a hyperparasite; Mercet (1923) indicates *Polychrosis botrana* Schiffermuller et Denis (Eucosmidae) as host.

**Affinities:** *B. hime* Habu resembles this species in the following characters: (i) general colouration of hind legs; (ii) apex of scutellum rounded; (iii) the rough surface of the thorax; (iv) in the nature of punctures on the hind femora. But *B. hime* differs from *B. secundaria* in having: (i) the frons with distinct pre-orbital carinae; (ii) scrobe reaching the front ocellus; (ii) smaller and less convex compound eyes, and (iv) scutellum low in lateral view.

**Remarks:** The above account of *B. secundaria* is based on the description given by Habu (1960).

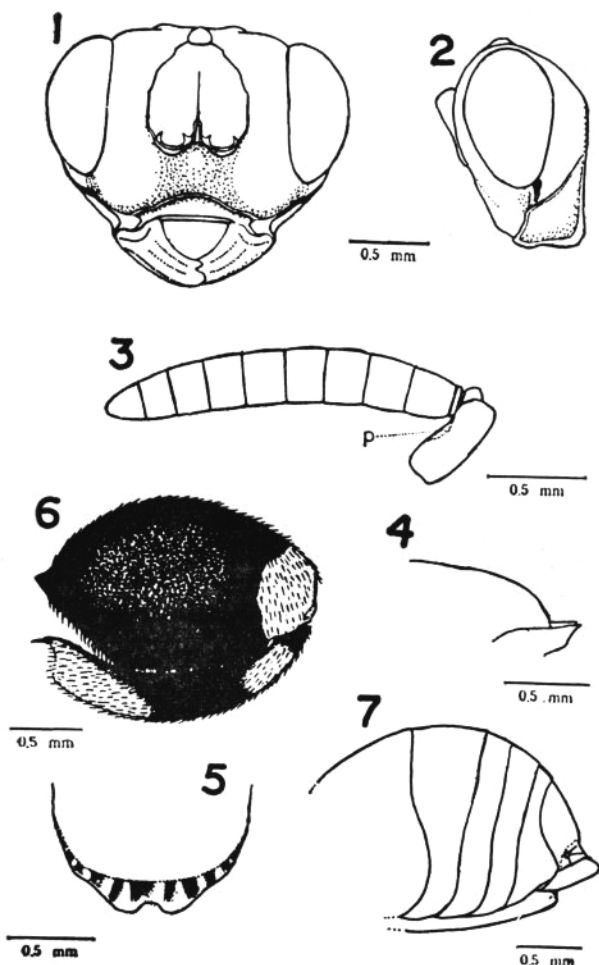
#### 42. *Brachymeria hattoriae* Habu, (42: Figs. 1–7)

1961: *Brachymeria hattoriae* Habu, *Kontyu* 29: 273–276.

**Female:** Length 5.3–5.7 mm. Black; scape brown or dark brown at dorso-apical area and with rather small, elongate yellowish-brown patch at ventro-inner area; tegulae whitish-yellow, with basal area dark brownish. Coxae black; fore and mid femora black, with apical area yellow; hind femora (Fig. 6) with moderately large yellow patch at apex, patch extending from outer side into inner side; fore tibiae yellow, somewhat reddish at inner side, with black long patch at outer side; mid tibiae yellow, with black patch behind middle; hind tibiae (Fig. 6) yellow and black, basal area reddish black, sub-basal area yellow, median one-third black, slightly reddish in part, apical one-third yellow. Pubescence and bristles on body silvery-white.

**Head** (Fig. 1) as wide as or slightly narrower than thorax, transversely wider in ventro-front aspect; shallowly pitted on dorsal half, irregularly rugose-carinate on ventral half; area below scrobe almost wholly rugose-carinate; surface in scrobe smooth, transversely rugose at dorsal area; width of ocellar area less than two-thirds as wide as interocular space at level of hind ocelli; interocellar space

two and two-sevenths to two and three-fourths as wide as major axis of hind ocelli; frons without preorbital carina; scrobe occupying a little more than one-half of width of interocular space, reaching



42: Figs. 1-7. — *Brachymeria hattoriae* Habu (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in lateral view; 5, scutellum in dorsal view;  
6, hind femur and tibia; 7, abdomen in lateral view.

front ocellus; inter-antennal projection relatively wide; area below scrobe with small, slightly convex area below inter-antennal projection, somewhat depressed below antennal sockets and along fronto-clypeal suture; malar space a little less than one-half as high

as compound eyes; postorbital carina distinct, though becoming indistinct before reaching hind margin of genotemporal regions; front genal angle acute, hind angle rather obtuse and somewhat rounded. Antennae (Fig. 3) stout though not thickened towards apex; scape stout and relatively short, a little more than two and one-half times as long as maximum width in lateral aspect; apex of scape remote from front ocellus; length of scape equal to one and one-eighth to one and one-seventh times as long as the length of segments 4 and 5 combined; segments 4 to 10 slightly decreasing in length; segments 6 to 10 and club very slightly decreasing in width; club twice as long as segment 10.

*Thorax* moderately compactly pitted on dorsal side; interspaces of pits narrow, weakly carinate, but somewhat wide in part, not reticulate. Scutellum (Figs. 3, 4 & 5) not high in profile, gently declined posteriorly; apical area widely explanate and reflexed, forming two distinct lobes. Forewing two and two-thirds as long as wide; marginal vein one-half or more than one-half as long as submarginal; postmarginal vein one-fourth to one-third as long as marginal; stigmal at least one-half as long as postmarginal. Hind coxae distinctly densely punctate and pubescent on ventral side, without protuberance on inner ventral area. Hind femora (Fig. 6) one and three-fifths to one and three-fourths as long as wide; outer side compactly punctate and densely pubescent, punctures small, somewhat confluent, so interspaces of punctures rather carinate, not reticulate; inner side densely punctate (less densely than outer side), punctures small, not confluent; inner ventral area with a trace of faint protuberance near base; outer ventral margin with nine to eleven relatively small teeth.

*Abdomen* (Fig. 7) oval, as long as or slightly longer than mesoscutum and scutellum combined, widest at middle, a little narrower than thorax. First tergite smooth. Second tergite minutely densely punctate at dorsal side, with large punctures at basodorsal and latero-dorsal areas, with distinct dense punctures at dorsal half of lateral sides. Ovipositor sheath visible from above.

*Male* : Unknown.

*Holotype* 1 ♀, VIII. 5, 1953, Nurukawa, Takedate, Aomori Pref., 1. Hattori leg., preserved in the Laboratory of Insect Identification and Taxonomy, National Institute of Agricultural Sciences, Tokyo, Japan, *Paratype* 1 ♀, VII. 1932, Mt. Takao, Tokyo Metropolitan District, T. Ishii leg. (After Habu 1961).

*Distribution* : Japan. Although this species has not yet been recorded from the Oriental Region, we believe that this species may be

present in this Region. And as its subspecies *B. hattoriae shillongensis* has already been recorded from India, we thought that the inclusion in this Monograph of the full description of *B. hattoriae* is justified.

*Hosts* : Unknown.

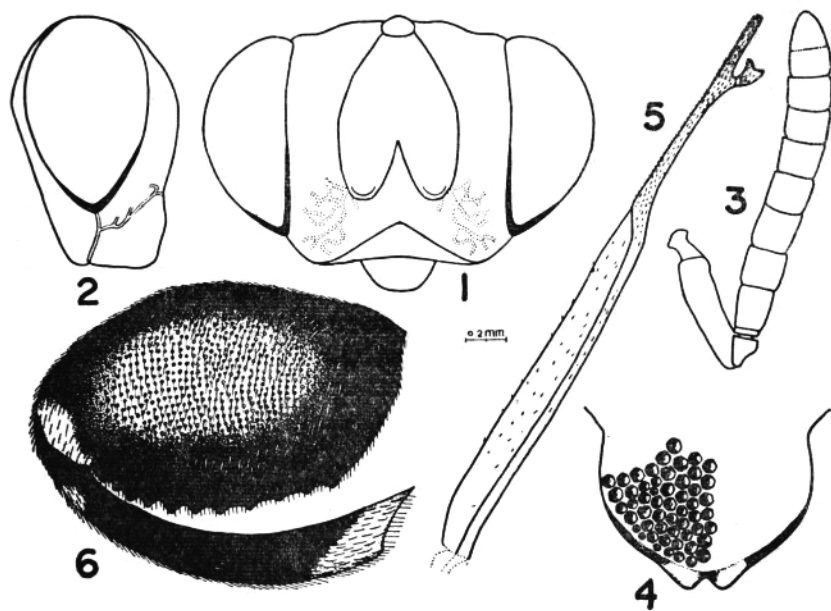
*Affinities* : *Brachymeria coloradensis* Cresson resembles *B. hattoriae* Habu in many features but differs from it in having the scutellum high and more convex in lateral view, and strongly and perpendicularly declined posteriorly.

*Remarks* : The above account is based on the description given by Habu (1961).

**43. *Brachymeria hattoriae shillongensis*, Joseph *et al.***

(43: Figs. 1-6)

*Female* : Length 5.46 mm. Black; tegulae pale yellow with brownish-black basal margin. Coxae, trochanters and femora black except the distal tips of femora which are brownish-yellow. Fore and mid tibiae brownish-yellow with a black colouration in the middle at outer, inner and ventral sides. Hind tibiae black with a



43: Figs. 1-6. — *Brachymeria hattoriae shillongensis*, Joseph *et al.* (♀)

1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, forewing venation; 6, hind femur and tibia.

yellowish patch subbasally and apically. All tarsi brownish-yellow. Pubescence whitish and moderate.

*Head* (Fig. 1) width a little less than that of thorax, a little over one and two-fifths as wide as its own length; surface of head with rounded, reticulate and close pits; interspaces of pits and inside of the pits rugose. Surface of scrobe smooth and shiny with the sides rugulose; scrobe deep, occupying a little over half the interocular space, attaining the front ocellus. Length of scrobe about one and one-third its width; parascrobal space about two-fifths the width of scrobe. Length of eye (Fig. 1) a little over two and one-third its own width; median ocellus slightly larger than the lateral ocellus; the distance between median and lateral ocelli one-third the interocellar distance; interocular space about three times the interocellar distance; interocellar distance twice the ocellocular distance. Width of clypeus four times its median length. Width of labrum a little more than two and one-fourth its median length. Interocellar distance about two and one-fifth the maximum diameter of the lateral ocellus. Frons without preorbital carina; postorbital carina present (Fig. 2) and branched. Inter-antennal projection moderate; lateral ridges of scrobe not produced in front of the antennal toruli. Height of malar space a little less than one-third the height of eye (Fig. 2). Front genal angle slightly acute; hind genal angle nearly rectangular. Antenna (Fig. 3) stout; scape not exceeding the front ocellus, almost as long as the length of segments four to six combined, contracted slightly after the middle; pedicel a little longer than wide; ring segment four times as wide as long; segment four longer than wide; segments five to seven of equal length; segments eight to ten of equal length; segment five wider than segment four and shorter than segment six; segment seven wider than six and equal in width to segments eight and nine; segment ten the widest of all funicular segments; club length twice that of tenth segment and one and two-thirds its own width.

*Thorax* (Fig. 4) provided with reticulate, rounded, umbilicate and close pits; interspaces of pits narrow and rugose. Width of mesoscutum a little over one and three-fifths its own length; notaulices distinct. Width of scutellum about one and one-third its own length, high in lateral view, gently declined posteriorly; apical margin explanate and emarginate with sparse pubescence. Forewing two and two-thirds as long as wide; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane; marginal vein (Fig. 5) hardly a little more than half the submarginal; postmarginal about one-third the marginal, a little less than two times the stigmal.



Hind coxa moderately punctate and pubescent on the ventral side without a tooth. Length of hind femur (Fig. 6) one and two-thirds its own width; outer side closely punctured and pubescent; inner side with sparse punctures and sparse pubescence without a tooth at base; ventral margin with a row of twelve black teeth (Fig. 6); teeth 2, 3, 10 and 11 small, 12 smallest, the rest larger and almost of equal size. Hind tibia longer than hind femur.

*Abdomen* length almost equal to that of pronotum, meso-scutum and scutellum combined, a little more than one and one-fifth its own height; highest in the middle. First tergite smooth and shiny. Second tergite with punctures on the basolateral regions and with microsculptures on the rest of the portions; pubescence on the lateral sides. Sixth tergite with seven or eight transverse rows of pits, each row with several pits.

*Holotype* ♀, Coll. No. 251 on pin, antenna and forewing on slide No. 251a and hind femora on slide No. 251b. INDIA: Assam State, Shillong, Coll. M. J. Chacko in November 1961, from pupa of hairy caterpillar on forest trees. The type deposited in British Museum (Natural History), London.

*Distribution*: India.

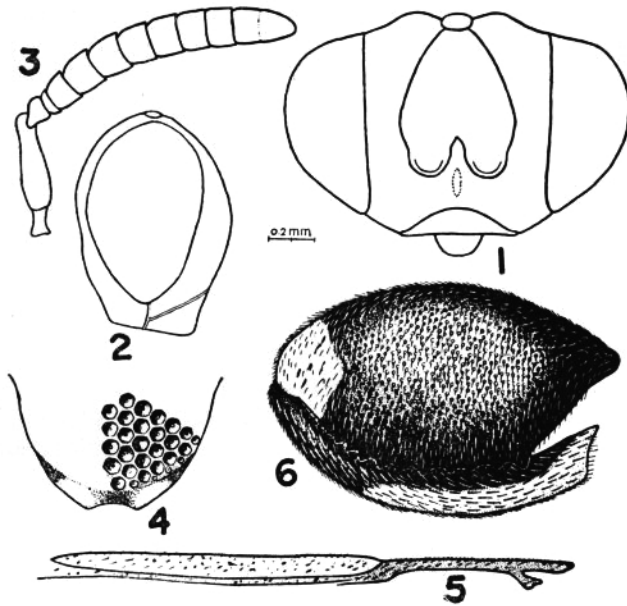
*Host*: Undetermined pupa of a hairy caterpillar on forest trees.

*Remarks*: This subspecies can be distinguished from *Brachymeria hattoriae* Habu in the following characters: (i) postorbital carina is branched in this subspecies whereas it is not branched in *Brachymeria hattoriae*; (ii) scape brown or dark brown at dorsal apical area and with rather small, elongate yellowish-brown patch at ventral inner area in *B. hattoriae* whereas in this subspecies the scape is black; (iii) in *B. hattoriae* the interocellar space is two and two-sevenths to two and three-fourths as wide as the maximum diameter of lateral ocellus and in this subspecies interocellar distance is about two and one-fifth the maximum diameter of lateral ocellus; (iv) height of malar space a little less than one-third the height of compound eyes.

**44. *Brachymeria croceogastralis* Joseph *et al.* (44: Figs. 1-6)**

*Female*: Length 3.77 mm. Generally black; abdomen yellowish-orange coloured; tegulae yellowish with blackish-brown basal margin. Fore coxa and trochanter blackish-brown; femur blackish-brown except the distal end which is yellowish; tibiae yellow. Mid coxa and trochanter blackish-brown; femur blackish-brown except the distal tip which is yellow; tibia yellow. Hind coxa and trochanter some-

what liver-brown; femur somewhat liver-brown in colour except the distal tip which is whitish-yellow; tibiae whitish-yellow except the base where it is liver-brown in colour.



44: Figs. 1-6. — *Brachymeria croceogastralis* Joseph *et al.*

1, head in front view; 2, head in lateral view; 3, antenna; 4, scutellum in dorsal view; 5, forewing venation; 6, hind femur and tibia.

**Head** (Fig. 1) width a little more than that of thorax; length a little less than one and a half times its own width; surface of head with reticulate and rounded pits, interspaces of pits and inside of pits rugose. Surface of scrobe smooth and shiny except the sides which are rugulose; scrobe deep, occupying a little more than half of the interocular space, attaining the front ocellus. Length of scrobe a little less than one and two-fifths its width; parascrobal space a little less than one-third the width of scrobe. Facial area evenly carinate, carination not coarse. Area below the scrobe at middle narrow and smooth. Length of eye (Fig. 1) a little over two and one-fourth its width; median ocellus slightly larger than lateral; distance between median and lateral ocelli distinctly a little more than one-third the interocular distance; interocular space hardly a little less than two and two-thirds the interocular distance. Width of clypeus four times its length. Width of labrum twice its length. Width of ocellar

area a little less than two-thirds interocular space; interocellar distance two and three-fourths the maximum diameter of the lateral ocellus. Frons without preorbital carina; postorbital carina present and reaching the genotemporal margin (Fig. 2). Inter-antennal projection moderately developed; lateral ridges of scrobe not produced in front of the antennal toruli; height of malar space (Fig. 1) about one-fourth the height of eye; front genal angle slightly acute; hind genal angle slightly obtuse and rounded. Antenna (Fig. 3) rather thin, scape not exceeding the front ocellus, longer than the length of segments four to six combined, contracted after the middle; pedicel as wide as long; ring segment a little less than four times as wide as long; fourth segment wider than long; segments five to ten of equal width and almost equal length; length of club hardly a little over twice the length of segment ten, a little over one and two-thirds its own width.

*Thorax* provided with reticulate, rounded, umbilicate and close pits (Fig. 4); interspaces of pits narrow and strongly rugose; mesoscutum one and two-thirds as wide as its length; notaulices distinct; scutellum a little over one and one-fifth as long as wide; moderately high in lateral view, gently declined posteriorly, apical margin explanate and emarginate with pubescence. Forewing distinctly less than two and a half times as long as wide; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane; marginal vein (Fig. 5) a little less than half the submarginal; postmarginal about one-third the marginal, twice as long as stigmal. Hind coxa on outer side with close punctures and pubescence; inner side smooth and shiny without a tooth. Hind femur (Fig. 6) a little over one and three-fourths as long as wide; its outer side with close punctures and pubescence; inner side without a tooth at base. The ventral margin of femur with a row of twelve black teeth as in figure (Fig. 6); tooth, 1 biggest of all; 2 smaller than 1; 3, 4 & 11-12 of equal size and smaller than 5-10 which are of moderate size. Hind tibia longer than hind femur.

*Abdomen* not elongate but fairly rounded; length less than the length of pronotum, mesoscutum and scutellum combined, highest a little backwards of the middle. Abdomen distinctly less than one and a half times as long as its own height. First tergite extending to half of the abdomen, smooth. Second tergite with very few punctures and sparse pubescence on the baso-lateral regions. Sixth tergite with fourteen to sixteen longitudinal rows of pits, each row with six to seven pits, the pits deep and interspaces rugose with pubescence.

*Holotype* 1 ♀, Coll. No. 272 on pin, its antenna and forewing on slide No. 272a and hind leg on 272b. *Paratypes* 2 ♀ ♀, Coll. No. 271

on pin, its antenna and forewing on slide No. 271a and hind leg on slide No. 271b and Coll. No. 273 on pin. INDIA: Mysore State, Bangalore, Coll. V. P. Rao from unidentified pupa in September 1957. Holotypes deposited in British Museum (Natural History), London. Paratype (No. 273) deposited in U. S. National Museum, Washington.

*Distribution:* India.

*Host:* Unknown.

*Affinities:* This species resembles *Brachymeria semirufa* Walk. in the following characters: (i) preorbital carina absent; (ii) punctures on the thorax close and interspaces between the punctures narrow; (iii) colour of the body almost similar. But it differs from this species mainly: (i) in having the apex of scutellum rounded off; (ii) postorbital carina weakly developed compared to the postorbital carina of *Brachymeria croceogastralis*; (iii) postorbital carina usually branched in *B. semirufa* whereas in *B. croceogastralis* it is straight, not branched, and strongly developed; (iv) first tooth of hind femur of *B. croceogastralis* is comparatively longer than that of *B. semirufa*; (v) scrobe separated from front ocellus by narrow rugose area in *B. semirufa*.

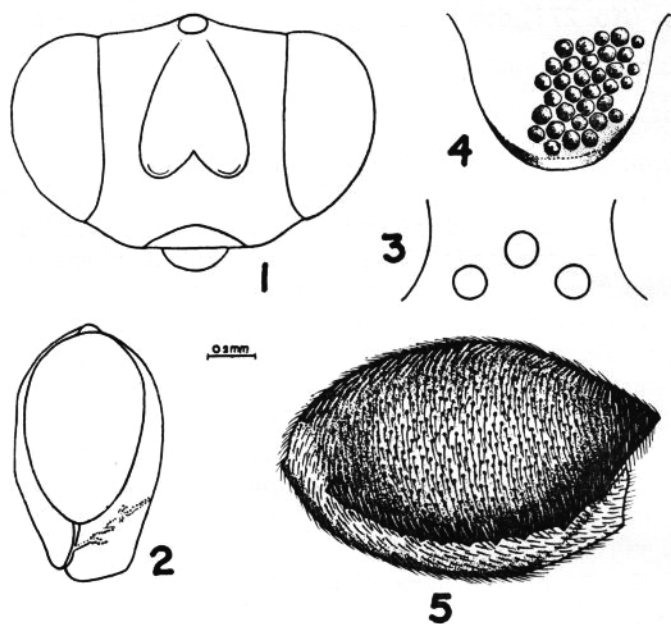
#### 45. *Brachymeria semirufa* Walk. (45: Figs. 1 – 5)

1871: *Chalcis semirufa* Walker, *Notes on Chalcids*, 3: p. 48.

*Female:* Length 3.7 mm. Black; tegulae pale yellowish with yellowish-brown basal region. Fore coxa and trochanter brownish-black; femur blackish-brown except the tip which is pale yellow; tibia pale yellow with a pale brown colouration on the inner middle region; tarsus pale yellow. Mid coxa brownish-black, femur blackish-brown except the tip which is pale yellowish; tibia pale yellowish with a pale brownish colouration on the inner middle portion; tarsus pale yellow. Hind coxa blackish-liver brown; trochanter brownish-black; femur hepaticolour or sometimes blackish except the tip which is pale yellow; tibia pale brownish-yellow with the base blackish-brown which extends on the ventral aspect to the distal end with a slight extension in the middle to the dorsal region; tarsus pale yellowish. Abdomen reddish. Pubescence dirty-white, dense on face and moderate in other regions.

*Head* (Fig. 1) width a little less than that of thorax, a little more than one and one-third its length; surface of head mostly with rounded close pits; interspaces of the pits rugose and carinate.

Scrobe deep, smooth; the maximum width of scrobe about three-fifths the interocular space at the level of hind ocelli; its distal end separated from front ocellus by narrow rugose area. Length of scrobe



45: Figs. 1-5. — *Brachymeria semirufa* Walker (♀)

1, head in front view; 2, head in lateral view; 3, vertex in dorsal view;  
4, scutellum in dorsal view; 5, hind femur and tibia.

one and one-third its maximum width; parascrobal space one-third the width of scrobe. Length of eye (Fig. 1) a little more than twice its width; median ocellus (Fig. 3) slightly larger than lateral; the distance between median and lateral ocelli (Fig. 3) a little less than half the interocellar distance; interocular space a little over two and a half times the interocellar distance. Width of clypeus a little more than four times its median length; width of labrum three times its median length; width of ocellar area three-fourths interocular space; interocellar distance a little more than two and one-third the maximum diameter of the lateral ocellus. Frons without preorbital carina; postorbital carina branched as in Fig. 2 (but in specimens collected from Vietnam it is not branched). Inter-antennal projection thin and small; lateral ridges of scrobe not produced in front of the antennal toruli; area below scrobe not smooth; height of malar space (Fig. 1) about one-third the height of eye; front genal angle and hind genal

angle nearly rectangular. Antenna with minute dirty-white pubescence; scape not exceeding the front ocellus, contracted after the middle, almost as long as the length of segments 4 to 6 combined. Pedicel almost of equal length and width; ring-segment four and a half times as wide as long.

*Thorax* with large, rounded, reticulate, umbilicate and close pits (Fig. 4); interspaces of pits rugose and narrow; notaulices distinct. Scutellum a little more than two times as wide as its length, high in lateral view, gently declined posteriorly; apical margin explanate, and rounded off with moderate pubescence. Forewing a little more than two and one-fifth as long as wide, pubescence sparse in the basal one-fourth and close in the rest of the wing membrane. Marginal vein a little less than half the submarginal; postmarginal half of the marginal; about twice as long as the stigmal. Hind coxa with moderate punctures and pubescence on ventral side without a tooth at its inner side. Hind femur (Fig. 5) on outer side with distinct punctures and pubescence; a little more than one and two-thirds as long as wide; outer ventral margin with a row of ten teeth; inner side without a tooth at base.

*Abdomen* in lateral view not acute posteriorly; shorter than the length of pronotum, mesoscutum and scutellum combined, highest after the middle, about one and a half times its own width. First tergite smooth and shiny. Second tergite with punctures on the lateral and dorso-lateral regions at the base except in the middle on the dorsal side; rest of the portions very faintly shagreened. Sixth tergite with 5 transverse rows of rounded pits, each row having 4 to 18 pits; interspaces of pits rugose; pubescence very sparse. Ovipositor sheath not visible from above.

*Male*: Length 3.2 mm. Resembles the female in almost all features; sixth tergite with 5 transverse rows of rounded pits, each row having 6 to 20 pits; interspaces between the pits rugose.

*Specimens examined*: 1 ♀ on pin, Coll. No. B. M. 1935-601, MALAYA: Kaula Lumpur, Coll. G. H. Corbett on 27. xi. 1924 from *Papilio agamemnon*. Determined by Z. Boucek in 1970; 1 ♀, Coll. No. C. U. 376 & Coll. No. C. U. 379 respectively, on pins. VIETNAM: Dailanh, North of Nha Trang, Coll. C. M. Yoshimoto on 30. xi-5.xii. 60. Det. by K. J. Joseph *et al.* on 1. ii. 71 from the collections of Bishop Museum, Honolulu.

*Distribution*: Vietnam, Burma and Malaya.

*Hosts*: *Papilio agamemnon* (Fam. Papilionidae).

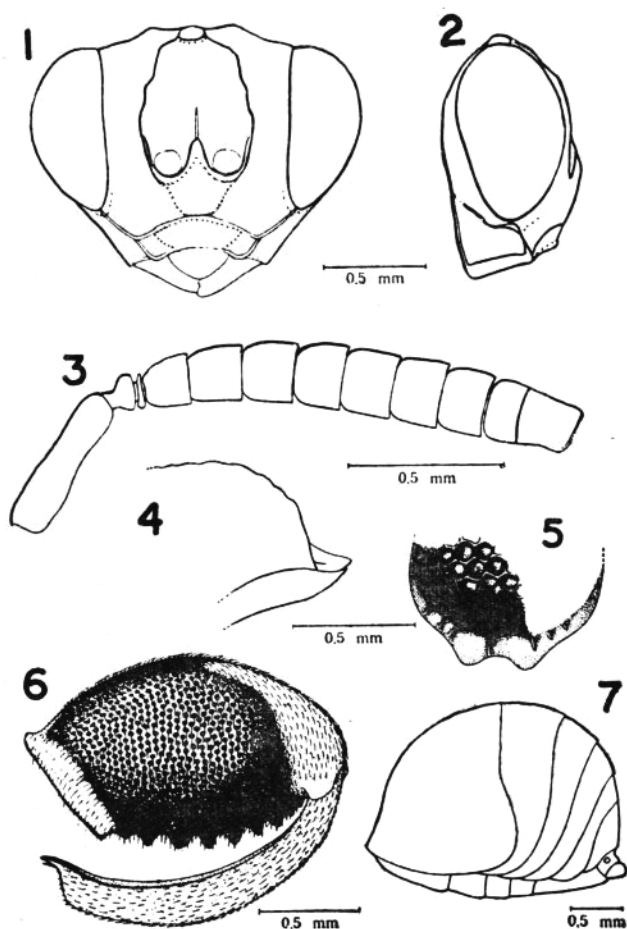
*Affinities*: *Brachymeria semirufa* Walk. shows resemblances to *B. croceogastralis* Joseph *et al.* in the following characters: (i) pre-orbital carina absent; (ii) punctures close; (iii) colour of the body almost similar. But *B. croceogastralis* can be distinguished by the presence of: (i) emarginate apex of scutellum; (ii) postorbital carina more strongly developed and not branched as in typical *B. semirufa* Walk.; (iii) first proximal tooth of hind femur comparatively longer than that of *B. semirufa*; (iv) width of head a little more than that of thorax in *B. croceogastralis*.

**46. *Brachymeria femorata* (Panzer) (46: Figs. 1-7)**

- 1810: *Chalcis femorata*, Panzer, *Faun. Ins., Germ.*, **7**: 84, pl. 16.
- 1834: *Chalcis femorata*, Walker, *Ent. Mag.* **2**: 28.
- 1909: *Chalcis koebelei*, Crawford, *Proc. Ent. Soc. Washington*, **11**: 207
- 1916: *Chalcis femorata*, Masi, *Ann. Mus. Civ. St. Nat. Genova* **47**: 78-81.
- 1922: *Chalcis femorata*, Ruschka, *Konowia*, **1**: 222, 224-225.
- 1923: *Chalcis femorata*, Mercet, *Rev. Fitopat.* **1**: 14, 17.
- 1938: *Brachymeria femorata*, Gahan, *Proc. Ent. Soc. Washington*, **40**: 209.
- 1940: *Brachymeria koebelei*, Masi, *Mushi* **13**: 2.
- 1950: *Brachymeria femorata*, Masi, *Eos, tomo extraord.*, 36, 43, fig. 2 (14).
- 1950: *Brachymeria koebelei*, Masi, *ibid.*, 32, 36, 43, fig. 2 (13).
- 1951: *Brachymeria femorata*, Boucek, *Acta Ent. Mus. Nat. Pragae* **27**, suppl. 1: 18, 19-20, 21-22 figs. 12-14.
- 1952: *Brachymeria femorata*, Nikol'skaya, *Opred. Faune SSSR* **44**: 87.
- 1959b: *Brachymeria femorata*, Steffan, *Cahiers des Naturalistes*, Bull. N. P. n. s. **15**: 35-38.
- 1960: *Brachymeria femorata*, Habu, *Bull. Nat. Inst. Agr. Sci. Ser. C.*, No. **11**, p. 164-167.

*Female*: Length 5.5-6.5 mm. Black; tegulae clear yellow, with basal part dark reddish-brown. Coxae and trochanters shiny

black; trochanters slightly reddish; fore femora clear yellow, blackish brown at basal area (extreme base pale brown); mid femora blackish brown at basal two-thirds, with extreme base pale brown, apical one-third clear yellow; hind femora (Fig. 6) shiny black, apex with large yellow ring which extends on to outer dorsal side, base with rather long yellow patch on outer side along ventral side in typical form, often basal and apical patches larger, united together and median black area becoming smaller and brownish; tibiae wholly clear yellow.



46: Figs. 1-7. — *Brachymeria femorata* (Panzer) (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in lateral view; 5, scutellum in dorsal view;  
6, hind femur and tibia; 7, abdomen in lateral view.



in hind tibiae outer ventral carina blackish. Pubescence on body and bristles on abdomen silvery-grey.

*Head* (Fig. 1) almost as wide as thorax; surface rather distinctly pitted on dorsal side, weakly pitted on front and lateral sides; area below scrobe at middle with pits fairly sparse and almost smooth; surface in scrobe almost smooth, faintly rugose; width of ocellar area three-fourths as wide as interocular space at level of hind ocelli; interocellar distance two and one-third times as wide as major axis of hind ocelli; preorbital carinae absent; scrobe relatively deep, occupying three-fifths of width of interocular space, reaching front ocellus; inter-antennal projection elongately triangular; area below scrobe somewhat convex at middle and below each antennal socket, somewhat depressed at lateral and ventral parts along clypeus; fronto-genal sutures relatively weakly carinate; height of malar spaces slightly less than one-third as high as compound eyes; postorbital carina moderately developed; front genal angle somewhat acute though rounded, hind angle almost rectangular. Antenna (Fig. 3) not stout; scape not exceeding front ocellus, nearly as long as segments 4 to 6 combined, widest at basal one-third; pedicel nearly as long as wide; segments 4 to 9 almost equal in length and width; club twice as long as segment 10.

*Thorax* moderately and compactly pitted on dorsal side; interspaces of pits narrow, carinate, almost smooth except on pronotum; mesoscutum as wide as long; scutellum fairly high in profile, strongly, almost perpendicularly declined towards apex, with dense bristles near apex; apical area widely explanate and reflexed, forming two distinct lobes (Figs. 4 & 5). Forewing two and two-thirds as long as wide; marginal vein five-eighths as long as submarginal; postmarginal two-fifths as long as marginal, more than twice as long as stigmal. Hind coxa distinctly and densely punctate and pubescent at ventral side, without protuberance on inner ventral side; hind femur (Fig. 6) one and three-fourths as long as wide, outer side distinctly and densely punctate and pubescent, not striate, punctures rather large; inner side minutely and less densely punctate than on outer side; inner ventral area without protuberance near base; outer ventral margin with eleven or twelve teeth

*Abdomen* (Fig. 7) short, almost rounded in dorsal aspect, perpendicular at posterior part in lateral aspect, as long as pronotum, mesoscutum and scutellum combined, widest near middle, almost as wide as thorax. First tergite smooth. Second tergite with large, distinct, relatively dense, bristled punctures and with fine distinct, dense, non-bristled punctures except on ventro-lateral and basal areas,

but non-bristled punctures indistinct at anterior area. Sixth tergite more distinctly and densely pitted. Ovipositor sheath slightly or not visible from above.

*Male*: Length 4.2 mm. Funicle with trichoid sensillae on ventral side.

*Distribution*: India, Japan, Korea, Mongolia, South China, Formosa, Burma, Siberia, Asia Minor, Europe and North Africa.

*Hosts*: This is known as a parasite of butterflies belonging to the Pieridae (*Aporia crataegi* Linn., *Pontia daplidice* Linn., *Pieris rapae* Linn., *Pieris brassicae* (Linn.), Zygaenidae (*Zygaena filipendulae* Linn.), Satyridae (*Pyrameis cardui* Linn.) and Nymphalidae.

*Affinities*: *Brachymeria femorata* (Panzer) and *B. megaspila* Cameron closely resemble each other except that the basal and apical yellow patches on the hind femur are not united together on outer dorsal side in *B. femorata* in typical form. But Akinobu Habu (1960) points out that in specimens of *B. femorata* from Mongolia and Korea, "the apical and basal yellow colourations often tend to unite and the median black area then becomes smaller" (as in the case of *B. megaspila*). In this case, the identification becomes very difficult and we cannot establish clear-cut differences between the two species.

*Remarks*: According to Mani (1938) several specimens of *Brachymeria koebelei* Crawford, determined by Masi, are present in the collections of the Indian Museum, Calcutta. These are reported to have been collected from Nilgiris, Bangalore, Puri and Margherita in India. Habu (1960) has synonymized *B. koebelei* with *B. femorata* (Panzer.) However, as it has not been possible for us to study the type specimens of *B. femorata* and *B. koebelei*, we are unable to give a definite opinion regarding the justification or otherwise of this synonymy. Steffan (1959 b) has synonymized *B. koebelei* with *B. ornatipes* and according to him *B. ornatipes* differs from *B. femorata* in having the punctures on the outer side of the hind femora smaller and the head is compressed from the front and hind directions in the lateral aspects (in *B. ornatipes*).

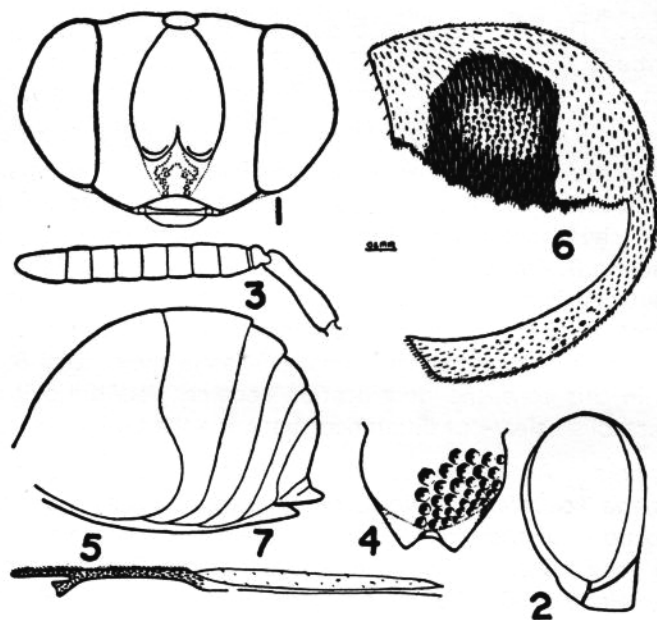
#### 47. *Brachymeria megaspila* Cameron (47: Figs. 1-7)

1906: *Chalcis megaspila*, Cameron, *J. Bombay nat. Hist. Soc.*, VII, p. 581.

1925: *Chalcis megaspila*, Ramkr. *Spol. Zeyl.*, XIII, p. 239.

*Female*: Length 4.5-5 mm. Black; tegulae clear yellow with the basal margin dark reddish-brown. Coxae black, hind trochanter

reddish-brown; fore femora clear yellow with the basal area blackish-brown on outer aspect; mid femora blackish-brown at basal two-thirds and clear yellow in the remaining portions; hind femora yellow or reddish-yellow with a black patch in the middle as in figure 6. Tibiae wholly clear yellow, except that in hind tibiae the outer ventral carina is blackish. Tarsi pale yellow. Pubescence on body and bristles on abdomen silvery-grey.



47: Figs. 1-7. — *Brachymeria megaspila* Cameron (♀)  
 1, head in front view; 2, head in lateral view; 3, antenna;  
 4, scutellum in dorsal view; 5, forewing venation;  
 6, hind femur and tibia; 7, abdomen in lateral view.

*Head* (Fig. 1) a trifle wider than thorax, about one and a half times its own length; vertex distinctly and deeply pitted; interspaces between the pits rugose and narrow. Scrobal deep, smooth and shiny; its maximum width a little less than two-thirds the interocular space; length of scrobal one and two-fifths its maximum width, reaching the front ocellus; parascrobal space one-third the maximum width of scrobal. Length of eye about two and one-fifth its width; median ocellus distinctly larger than lateral. The distance between median and lateral ocelli one-third the interocular distance; interocular space two and one-fifth interocular distance; interocular distance three

and three-fourths ocellocular distance. Width of clypeus four and a half times its median length; width of labrum about five times its median length; width of ocellar area a little over three-fourths the interocular space; interocellar distance two and one-seventh the maximum diameter of lateral ocellus. Frons without preorbital carina; postorbital carina present and reaching the genotemporal margin (Fig. 2). Inter-antennal projection moderately developed. Lateral ridges of scrobe produced in front of antennal toruli as in figure. 1. Area below scrobe with a small median smooth and raised portion. Height of malar space slightly less than one-third the length of eye. Front genal angle somewhat acute, hind genal angle nearly rectangular. Antenna (Fig. 3) fairly stout. Scape almost reaching the front ocellus, shorter than segments four to six combined; pedicel a little wider than long; segments four to seven almost equal in length; width slightly increasing from segments five to ten. Club about one and a half times as long as wide, a little over twice as long as segment ten.

*Thorax* provided with reticulate, rounded, umbilicate and close pits (Fig. 4). Interspaces between the pits narrow and smooth except on pronotum, where these interspaces are rugose and narrow. Mesoscutum hardly a little over two and one-sixth as wide as long. Scutellum length subequal to its width, fairly high in profile, strongly almost perpendicularly declined posteriorly; apical flange explanate and emarginate with dense pubescence. Dorsal margin of the lateral face of pronotum almost complete and slightly interrupted anteriorly. Forewing two and four-fifths as long as wide. Marginal vein (Fig. 5) about three-fifths the submarginal; postmarginal hardly a little over two-fifths the marginal and a little over twice the stigmal. Hind coxa distinctly punctate and pubescent on its ventral side, without a protuberance or tooth. Hind femur (Fig. 6) a little over one and two-thirds as long as wide; its outer side distinctly punctate and pubescent; inner side with fewer punctures and pubescence and without a basal tooth; outer ventral margin with a row of 13 black teeth.

*Abdomen* (Fig. 7) a little shorter than pronotum, mesoscutum and scutellum combined, one and one-third as long as wide. First tergite smooth. Second tergite with large, distinct punctures in the basal half with a smooth area in the median region; its distal half in the dorsal region and distal one-fourth in the latero-dorsal regions finely microsculptured. Sixth tergite with six or seven transverse rows of distinct and deep pits each row with several pits. Ovipositor sheath punctate, slightly visible from above.

*Male*: Length 4.26 – 5 mm. Resembles the female in almost all features except in that: (i) the length of its abdomen is comparatively

shorter than that in the female; (ii) the sixth tergite is provided with five transverse rows of pits.

*Specimens examined*: INDIA: Kerala State, Calicut, 1 ♀, 8. vii. 67; 1 ♀, 23. vii. 68; 1 ♀, 8. vii. 67; 1 ♀, 31. v. 68, 1 ♂, 30. iv. 68; Kodengat, 1 ♀, 27. x. 68; Kasaragode (Kerala), 1 ♀, 30. iv. 63; Thalipparamba (Kerala), 2 ♀♀, 29. ix. 68; Quilandy (Kerala), 2 ♀♀, 8 vi. 68. Mysore State, Bathiaduka, 2 ♀♀ & 1 ♂, 1. x. 68; Puttur (Mysore State), 1 ♂, 1. x. 68; Coll. (for all above mentioned specimens) Joseph *et al.* Coll. Nos. C. U. 54 to 74 from the collections of the Department of Zoology, University of Calicut, Kerala. Coll. No. C. U. 392 from Bishop Museum, Honolulu. Coll. Nos. C. U. 938 to 950 from Museum National d'Histoire Naturelle, Paris; Coll. Nos. C. U. 1067 to 1068 from Faculty of Entomology, Tamilnadu Agricultural University, Coimbatore; Coll. No. C. U. 1892 from Magyar Nemzeti Museum, Budapest.

*Distribution*: India, Vietnam and Java.

*Remarks*: *B. femorata* (Panzer) and *B. megaspila* Cameron closely resemble each other except that the basal and apical yellow patches on the hind femur are not united together on outer dorsal side in *B. femorata* in typical form. But Habu (1960) points out that in specimens of *B. femorata* from Mongolia and Korea, the apical and basal yellow colourations often tend to be united and the median black area then becomes smaller (as in the case of *B. megaspila*). In this case, the identification becomes very difficult and we cannot establish clear-out differences between the two species.

#### 48. *Brachymeria auratopubescens* Joseph *et al.*

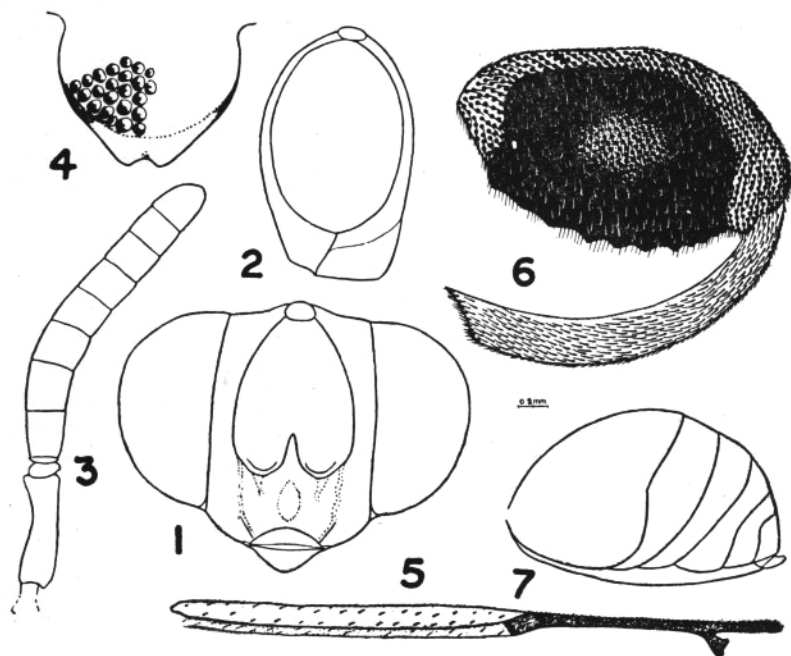
(48: Figs. 1–7)

1972: *Brachymeria auratopubescens*, Joseph *et al.* *Oriental Ins.* 6 (3): 345–348.

*Female*: Length 6.68–7 mm. Black; tegulae clear yellow with the basal margin dark reddish-brown. Coxae and trochanters brownish-black; fore femora clear yellow with blackish-brown basal area; mid femora blackish-brown at basal two-thirds, with extreme base pale brown, its apical one-third clear yellow. Hind femora with a median black area as in figure 6, the long yellow patches at the base and apex being united together dorsally. Tibiae wholly clear yellow; outer ventral carina of hind tibia blackish; tarsi yellow, claws and arolium dark brown or black. Pubescence on body and bristles on abdomen golden yellow and dense.

*Head* (Fig. 1) width a little less than that of thorax, a little over one and one-fourth its own length; surface of head with moderate

pits; interspaces of pits and inside of pits rugose. Scrobe deep, fairly smooth and shiny, its maximum width a little more than four-fifths the interocular space, attaining the front ocellus; length of scrobe one and one third its maximum width; parascrobal space a little



48: Figs. 1-7. — *Brachymeria auratopubescens* Joseph et al (♀)

1, head in front view; 2, head in lateral view; 3, antenna;

4, scutellum in dorsal view; 5, forewing venation;

6, hind femur and tibia; 7, abdomen in lateral view.

less than one-fifth the width of scrobe. Length of eye (Fig. 1) about two and one-seventh its width; median ocellus a trifle larger than the lateral; the distance between median and lateral ocelli about half the interocellar distance; interocular space a little more than three times the interocellar distance; interocellar distance twice the ocellocular distance. Width of clypeus one and two-thirds its median length; width of labrum a little less than one and a half times its median length; width of ocellar area about three-fourths the interocular space; interocellar distance a little less than half the maximum diameter of the lateral ocellus. Frons without preorbital carina; postorbital carina weak, reaching the gonotemporal margin (Fig. 2); area below scrobe with a median, small, smooth, raised portion; lateral ridges of scrobe produced in front of the antennal toruli; inter-antennal projection

proportionately short; height of malar space a little less than one-third the height of eye; front genal angle slightly acute, hind genal angle slightly obtuse. Antenna (Fig. 3) stout, scape not exceeding the front ocellus, a little longer than one and three-fourths the length of segments four to six combined, widest at basal one-third; ring segment a little more than three times as wide as long; width of funicular segments almost equal from segments five to ten; fourth segment slightly narrower but longer than fifth; sixth and seventh subequal in length and longer than fifth; eighth, ninth and tenth subequal and longer than seventh; club length a little less than one and a half times the length of the tenth segment and a little more than its own width.

*Thorax* provided with reticulate, rounded, umbilicate and close pits (Fig. 4); interspaces of pits narrow and rugose. Width of mesoscutum a little less than twice its length; scutellum subequal in length and width, fairly high in profile, strongly and almost perpendicularly declined towards apex, with dense golden yellow bristles all around the margin; apical area explanate and emarginate (Fig. 4). Forewing a little more than two and four-fifths as long as wide; marginal vein (Fig. 5) a little more than half the submarginal; postmarginal a little less than one-third the marginal and a little more than two and three-fourths the stigmal. Hind coxa distinctly and densely punctate and pubescent at ventral side, without protuberance on inner ventral side. Hind femur (Fig. 6) one and three-fourths as long as wide; its outer side distinctly and densely punctate and pubescent with the interspaces between the punctures smooth and shiny; inner side without a basal tooth and with less dense punctures and pubescence; outer ventral margin with a row of ten to eleven teeth.

*Abdomen* (Fig. 7) longer than pronotum, mesoscutum and scutellum combined, a little less than one and three-fourths its height, highest beyond the middle. First tergite smooth. Second tergite on its basal half with large, distinct, relatively dense, bristled punctures limited to its dorsal side; apical half of the dorsal side with fine microsculptures; lateral sides with large bristled punctures all over. Sixth tergite with eight or nine transverse rows of pits, each row with several pits; the interspaces of pits and inside of pits rugulose, the pits often being invisible due to the dense golden yellow pubescence. Ovipositor sheath visible from above.

*Holotype* ♀, Coll. No. C. U. 451 on pin, its antenna and a forewing on slide No. 451a and hind leg on slide No. 451b; PHILIPPINES: Balabac Is., coll. H. Holtmann and W. Sanguita on 20.iv.1962. *Paratype* 1 ♀, Coll. No. C. U. 450 on pin; Coll. data same as for the Holotype. Types deposited in Bishop Museum, Honolulu.



*Specimens examined*: Coll. No. C. U. 1664 from Indian Agricultural Research Institute, New Delhi, and Coll. Nos. C. U. 1921 to 1924 from the collections of Magyar Nemzeti Museum, Budapest.

*Distribution*: Philippines and Java.

*Host*: Unknown.

*Affinities*: This species resembles *B. megaspila* described by Cameron in 1906 in the following characters: (i) almost similar colouration; (ii) absence of preorbital carina; (iii) closeness of punctures on the thorax; (iv) emarginate nature of the apex of scutellum. But this species differs from *B. megaspila* in having: (i) golden yellow pubescence all over the body; (ii) interspaces between the punctures on thorax rugose (whereas in *B. megaspila* the interspaces between the punctures are not rugose); (iii) pits on the vertex shallow and not very well demarcated as in the case of *B. megaspila*; (iv) much bigger size than *B. megaspila*; (v) scape (♀) longer than segments four to six combined; (vi) abdomen longer than pronotum, meso-scutum and scutellum combined.

*B. femorata* (Panzer) redescribed by Habu in 1960, also shows resemblance to this new species but differs in having: (i) absence of golden yellow pubescence; (ii) antenna which is not stout; (iii) scape length equal to the length of segments four to six combined; (iv) hind femora with blackish colouration reaching in most cases the dorsal margin.

#### 49. *Brachymeria ornatipes* Cameron (49: Figs. 1-7)

1906: *Chalcis ornatipes*, Cameron. *J. Bombay. nat. Hist. Soc.*, **17**, p. 290.

1925: *Chalcis ornatipes* (Cameron), Ramakrishna Ayyar, *Spol. Zeyl.* **XIII**, p. 239.

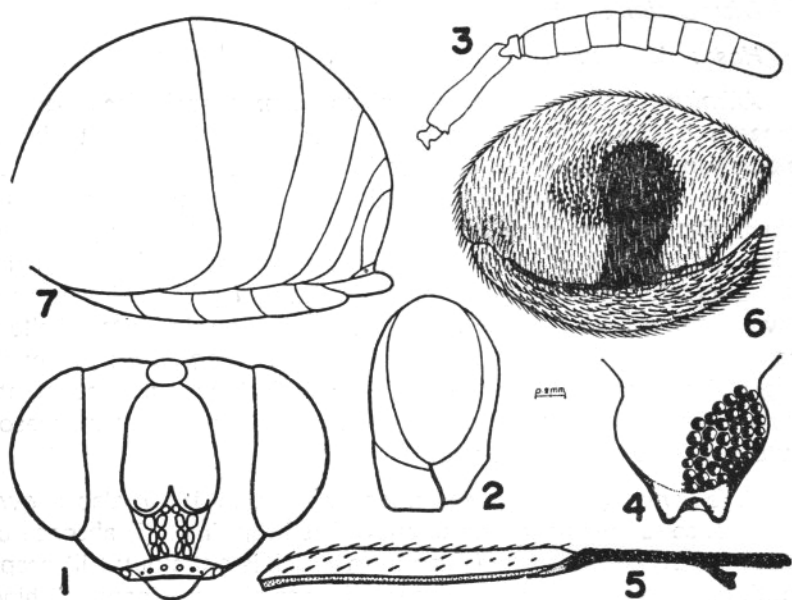
1962: *Brachymeria ornatipes* (Cameron), Habu: in *Fauna Japonica*, page 30.

1963: *Brachymeria ornatipes* (Cameron), Habu, *Mushi*, **37** (9): 120-121.

*Female*: Length 5.9 mm. Black; tegulae yellow. Coxae and trochanters black, fore and mid femora black with almost all of the distal half yellow. Hind femora yellow with a black colouration in the middle as in fig. 6. Tibiae and tarsi yellow with the arolium, claws and ventral carinae of the hind tibiae black. Pubescence dense and dirty-white.



*Head* (Fig. 1) width subequal to the width of thorax, one and a half times its own length. Vertex distinctly and deeply pitted with about five or six transverse rows of pits medially; pits smooth and



49: Figs. 1-7. -- *Brachymeria ornatipes* Cameron (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, forewing venation;  
6, hind femur and tibia; 7, abdomen in lateral view.

shiny inside; interspaces between the pits narrow and rugulose. Scrobe deep, smooth and shiny; its maximum width a little less than two-thirds the interocular space. Length of scrobe a little over one and one-third its maximum width, attaining the front ocellus. Para-scrobal space at its shortest length a little over one-third the maximum width of scrobe. Length of eye (Fig. 1) a trifle over two and two-fifths as long as its width; median ocellus a little larger than lateral; the distance between median and lateral ocelli a little over one-third the interocular distance; interocular space a little less than two and four-fifths the interocular distance; in terocellar distance two and one-third times ocellocular distance. Width of clypeus about five times its median length; width of labrum two-fifths its median length; width of ocellar area about three-fourths the interocular space; interocular distance about two and one-sixth the maximum diameter of the lateral ocellus. Frons without preorbital carinae. Postorbital carinae

present reaching the genotemporal margins (Fig. 2). Lateral ridges of scrobe produced in front of antennal toruli (Fig. 1). Area below scrobe with smooth median portion. Inter-antennal projection well developed. Front genal angle slightly acute, hind genal angle nearly rectangular. Antenna (Fig. 3) stout; scape not exceeding front ocellus, longer than segments four to six combined; pedicel a little wider than long; ring segment five times as wide as long; segments four to ten of almost equal thickness; club length a little less than one and a half times its basal width, a little less than twice as long as the tenth segment.

*Thorax* provided with reticulate, close and umbilicate pits with the interspaces between the pits narrow and smooth. Mesoscutum one and three-fifths as wide as long. Scutellum a little longer than wide, high in lateral view, almost perpendicularly declined posteriorly; its apical flange explanate and deeply emarginate (Fig. 4) with moderately dense pubescence. Dorsal margin of the lateral face of pronotum slightly interrupted anteriorly. Forewing a little over two and a half times as long as wide. Marginal vein (Fig. 5) half the submarginal; postmarginal a little less than half the marginal and slightly shorter than two and one-third the stigmal. Hind coxa with its ventral side distinctly pitted and pubescent; the interspaces between the pits smooth, without a tooth or protuberance on the inner side. Hind femur (Fig. 6) a little more than one and a half times as long as wide; its outer side distinctly pitted and pubescent with a row of 12 or 13 teeth on the ventral side; inner side with fewer punctures and pubescence.

*Abdomen* (Fig. 7) distinctly longer than pronotum, mesoscutum and scutellum combined, about one and one-fourth its height. First tergite dorsally smooth and shiny. Second tergite with fine deep punctures and pubescence in the basal half dorsally and laterally; rest of the dorsal side finely shagreened. Sixth tergite with about 9 or 10 irregularly transverse rows of pits medially, with dense pubescence. Ovipositor sheath not visible from dorsal side.

*Specimens examined* : 1 ♀ on pin; Japan, Keikido, coll. Chosen, 29. vi. 1929. Det. A. Habu.

*Distribution* : India and Japan.

*Remarks* : We have been able to examine a single specimen of *B. ornatipes* (Cameron) through the kindness of Dr. A. Habu, Division of Entomology, National Institute of Agricultural Sciences Tokyo, Japan, and this species resembles *B. megaspila* described by Cameron in 1906 very closely but differs from it in having: (i) the black

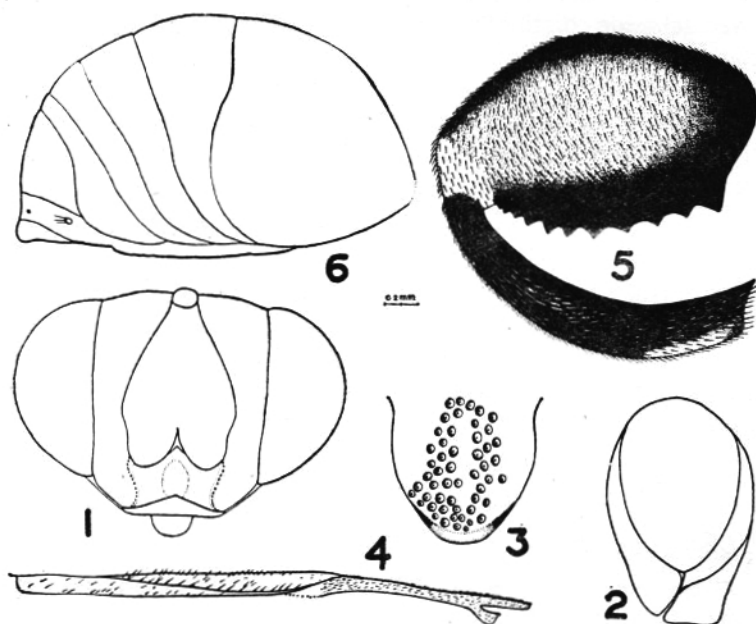
colouration on the hind femur smaller; (ii) the abdomen (♀) distinctly longer than pronotum, mesoscutum and scutellum combined; (iii) the scape (♀) longer than segments four to six combined.

*B. femorata* Panzer also resembles *B. ornatipes* Cameron closely but according to Steffan (1959b), *B. femorata* differs from *B. ornatipes* in having the punctures of the hind femora as large as those on the second tergite and the head is not compressed.

**50. *Brachymeria nigritegularis* Joseph et al. (50 : Figs. 1-6)**

1972 : *Brachymeria nigritegularis*, Joseph et al. *Oriental Ins.* **6** (1): 50 - 54.

*Female*: Length 5.11 mm. Black; tegulae pale-black. Fore and mid coxae, trochanters and femora black except the tips of femora which are yellow; tibiae yellow with a brownish black colouration in the middle region except on the dorsal side; tarsi pale brownish. Hind coxa, trochanter and femur black except the apex of femur which is yellow; tibia black with a yellow patch on the dorso-lateral side at the distal end; tarsus brownish. Pubescence whitish and moderate.



**50 :** Figs. 1-6. — *Brachymeria nigritegularis* Joseph et al. (♀)

1, head in front view; 2, head in lateral view; 3, antenna; 4, scutellum in dorsal view; 5, forewing venation; 6, hind femur and tibia.

*Head* (Fig. 1) width almost equal to that of thorax, about one and one-third as wide as long; surface of head coarsely pitted with the interspaces of pits rugose. Scrobe deep, smooth and shiny, its maximum width occupying space about equal to two-thirds the interocular space, attaining the front ocellus. Length of scrobe about one and a half times its maximum width; parascrobal space at mid eye level one-fifth the width of scrobe. Length of eye (Fig. 1) hardly a little more than two and one-fourth times its width; median ocellus equal in size to the lateral; the distance between median and lateral ocelli equal to half the interocellar distance; interocular space a little more than three times the interocellar distance; interocellar distance two and a half times ocellocular distance. Width of clypeus four times its median length; width of labrum twice its median length; width of ocellar area three-fourths interocular space; interocellar distance about one and a half times the maximum diameter of lateral ocellus. Frons without preorbital carinae; posrorbital carinae (Fig. 2) present, reaching the genotemporal margins; inter-antennal projection well developed; lateral ridges of scrobe produced in front of the antennal toruli; area below scrobe smooth in the middle; height of malar space about one-fourth that of eye; front genal angle slightly acute; hind genal angle nearly rectangular. Antenna fairly stout, scape not exceeding the front ocellus, longer than the segments four to six combined, contracted beyond the middle; pedicel a little longer than wide; ring segment four times as wide as long; fourth segment longer than any of the other funicular segments.

*Thorax* (Fig. 3) with rounded, reticulate and umbilicate pits. On the mesoscutum the interspaces between the pits are narrow and rugose except on the scapulae where the interspaces are slightly broader; pits on scutellum a little smaller and in the middle the interspaces of pits a little more than the diameter of the pits (Fig. 3). Mesoscutum one and two-thirds as wide as long; scutellum hardly a little wider than long, gently declined posteriorly; apical margin explanate, very slightly emarginate with moderate pubescence. Forewing about two and two-thirds as long as wide; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane; marginal vein (Fig. 4) a little less than half the submarginal; post-marginal one-third the marginal, and equal to two and a half times the stigmal. Hind coxa on ventral side with distinct deep punctures and moderate pubescence without an inner ventro-mesal tooth. Hind femur with small, dense punctures and moderate pubescence; its outer ventral margin with a row of eleven black teeth (Fig. 6); inner side without a basal tooth.

*Abdomen* (Fig. 6) distinctly shorter than the pronotum, meso-scutum and scutellum combined; highest in the middle, hardly a little more than one and one-third times as long as wide. First tergite smooth and shiny. Second tergite with distinct punctures on its dorso-basal area except in the middle where punctures are very sparse; the sides provided with punctures and pubescence; the remaining portions finely shagreened. Sixth tergite coarsely punctate with five rows of transverse rounded pits, each row with 16 to 20 pits; interspaces and inside of the pits rugose and moderately pubescent. Ovipositor sheaths slightly visible from above.

*Holotype* ♀, coll. No. 781 on pin; its antenna and forewing on slide No. 781a and hind leg on slide No. 781b; PHILIPPINES: Zambanga Mindanao, Coll. L. D. Brongersma and W. J. Roosdrop on 17. viii. 1952; deposited in Rijks Museum Van Natuurlijke Historie, Leiden.

*Distribution* : Philippines.

*Host* : Unknown.

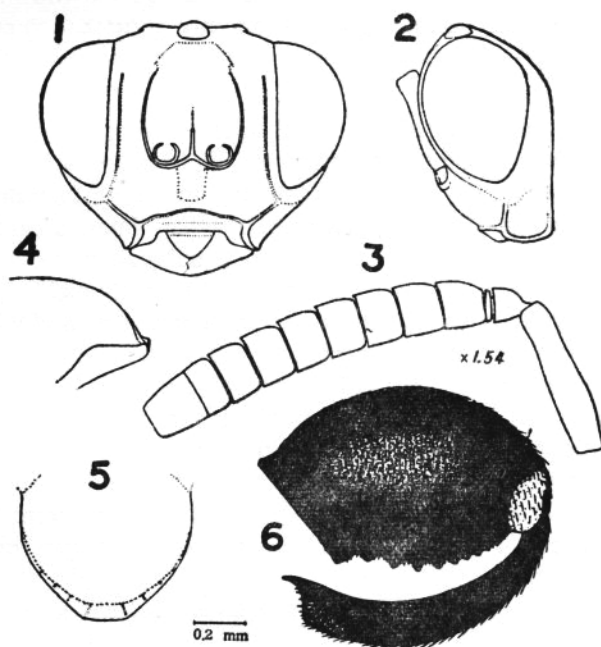
*Affinities* : This species resembles *Brachymeria inermis* (Fonsc.) in colouration but *Brachymeria inermis* (Fonsc.) differs from this species in having the following features : (i) punctures on the thorax close and interspaces carinate (whereas in *B. nigritegularis*, the punctures on the scutellum and scapulae are not close and interspaces in these regions are broad); (ii) presence of a weak preorbital carina in *B. inermis* (Fonsc.); (iii) a well developed postorbital carina not present as in the case of *B. nigritegularis*; (iv) base of the hind tibia reddish or brownish in *B. inermis*.

**51. *Brachymeria inermis* ( *punctulata* Forst.)(Fonscolombe)**  
(51 : Figs. 1-6)

- 1840 : *Chalcis inermis*, Fonscolombe, *Ann. Sc. Nat. Zool.* ser. 2, **13** : 187.
- 1859 : *Chalcis punctulata*, Forster, *Verh. Nat. Ver. Preus., Rheinl.*, **16** : 96.
- 1922 : *Chalcis punctulata*, Ruschka, *Konowia* **1** : 223, 227.
- 1950 : *Brachymeria punctulata*, Masi, *Eos*, tomo extraord., 38, 52.
- 1951 : *Brachymeria punctulata*, Boucek, *Acta Ent. Mus. Nat. Pragae*, **27**, suppl. 1 : 19, 20, 25, fig. 20.
- 1952 : *Brachymeria punctulata*, Nikol'skaya, *Opred. Faune SSSR*, **44** : 88.

- 1956 : *Brachymeria punctulata*, Boucek, *Bull. Res. Council Israel*, **5B** : 231.
- 1959b : *Chalcis inermis*, Steffan, *Cahiers Des Naturalistes*, Bull. N. P. n. s. **15**, 36, 40.
- 1960 : *Brachymeria punctulata*, Habu, *Bull. Nat. Inst. Agr. Sci.*, Ser. C. No. **11** : 206-209.
- 1962 : *Brachymeria inermis*, Habu, *Fauna Japonica*, p. 65-66.

*Male* : Length 3.0 mm. Black; tegulae yellow, with dark reddish-brown base. Coxae and trochanters black; femora black, apex rather narrowly yellow, yellow part of hind femora (Fig. 6) extending from outer side onto inner side. Fore tibiae yellow, with brownish-black patch at middle, patch interrupted on dorsal side. Mid tibiae black, with yellow base and apex. Hind tibia almost black with a yellow sub-basal area; base faintly reddish; apex brownish-yellow; apical



**51** : Figs 1-6. — *Brachymeria inermis* (Fonscolombe) (♂)  
 1, head in front view; 2, head in lateral view; 3, antenna;  
 4, scutellum in lateral view; 5, scutellum in dorsal view;  
 6, hind femur and tibia.

yellowish area rather small, smaller on outer side than on inner side. Pubescence on body silvery-grey.

*Head* (Fig.1) almost as wide as thorax. Pits on surface shallow; interspaces of pits more or less carinate. Scrobe deep, occupying three-fifths of interocular space, apex not attaining the front ocellus. Surface in scrobe polished. Area below scrobe somewhat convex at middle, with narrow unpitted space; depressed along fronto-clypeal suture. Frons with rather weak preorbital carina. Postorbital carina absent. Ocellar area three-fourths as wide as interocular space at level of hind ocelli. Interocellar distance two and one-third times as wide as major axis of hind ocelli. Inter-antennal projection fairly narrow. Genae somewhat tumid below compound eye. Malar space more than one-third as high as compound eye. Front genal angle slightly less than 90°; hind genal angle almost rectangular, though weakly rounded. Antennae (Fig. 3) slender; scape long, not exceeding front ocellus, as long as segments 4 to 6 combined, gently dilated before base; pedicel slightly wider than long; segments 4 to 6 slightly increasing in width; segments 6 to 10 and club equal in width; segment 4 slightly wider than long; segment 6 slightly shorter than segment 4 or 5; segment 6 to 9 equal in length; club more than twice as long as segment 10.

*Thorax* compactly pitted on dorsal side; interspaces of pits carinate, with distinct microsculpture throughout. Mesoscutum one and one-fourth times as wide as long. Scutellum (Figs. 4 & 5) relatively low, apical flange entire. Forewing two and one-half times as long as wide; marginal vein less than one-half as long as submarginal; postmarginal one-fourth as long as marginal, twice as long as stigmal. Hind coxa rather densely punctate and pubescent on ventral side and without an inner ventro-mesal tooth. Hind femur (Fig. 6) one and three-fourths as long as wide; outer side rather mat, faintly, densely and minutely punctate and with distinct microsculpture; inner side densely minutely punctate on dorsal half, sparsely on ventral half and almost impunctate and glabrous near ventral teeth, without microsculpture. Therefore surface of inner side is shiny, with trace of faint protuberance near base; outer ventral margin with about twelve teeth, first one rather large, rectangular.

*Abdomen* globose. First tergite faintly rugose on dorsal side. Second tergite densely minutely punctate though with narrow impunctate space along anterior and posterior margins on dorsal side and on dorso-lateral sides. Sixth tergite relatively short, faintly pitted.

*Specimens examined*: Coll. No. C. U. 383, 468, 661 & 667 from the collections of Bishop Museum, Honolulu.

*Distribution*: Asia Minor, Europe, Vietnam, Taiwan, Philippines, and Japan.

*Hosts*: This species parasitizes some Chrysomelidae (Coleoptera): *Cassida nebulosa* Linn. (after Manolache *et al.*, 1936). In Japan it has been bred from *Cassida rubiginosa rugosopunctata* Motschulsky (after Habu).

*Affinities*: *Brachymeria excarinata* Gahan resembles *B. inermis* in many features but it differs from it mainly in having: (i) scrobe reaching the front ocellus; (ii) hind tibia with the base not reddish or faintly reddish; (iii) genae not tumid below compound eye.

*Remarks*: The above account of *B. inermis* is based on the description given by Habu (1960).

**52. *Brachymeria excarinata* Gahan (52: Figs. 1-8)**

1925: *Brachymeria excarinata*, Gahan, *Philipp. Journ. Sci.* **27**: 90-91.

1940: *Brachymeria excarinata*, Masi, *Mushi*, **13**: 2.

1940: *Brachymeria excarinata*, Masi, *Boll. Lab. Ent. Agr. Portici* **3**: 261.

1940: *Brachymeria excarinata*, Pruthi *et* Mani, *Misc. Bull. Imp. Counc. Agr. Res.* no. **30**: 4, pl. 3, fig. 5.

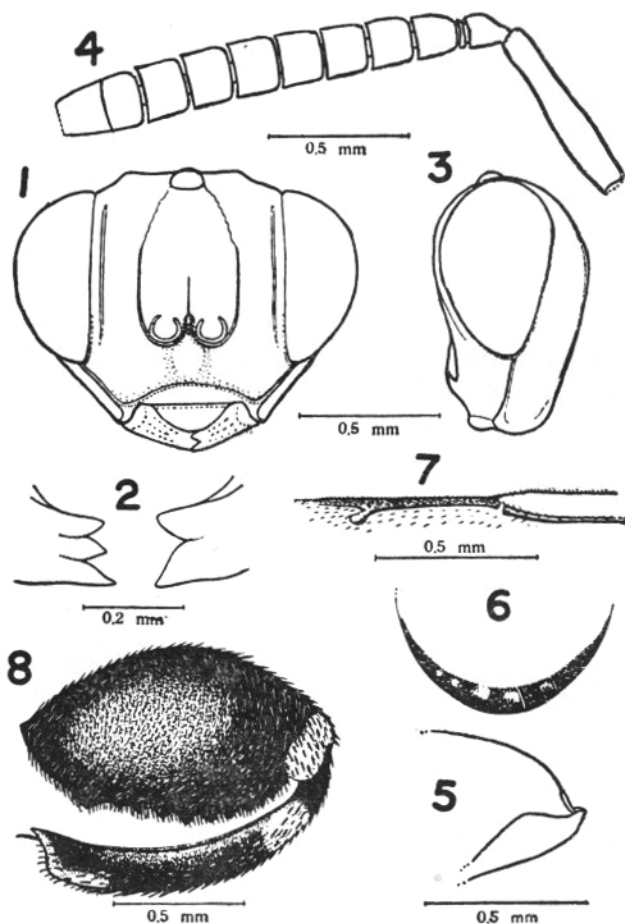
1960: *Brachymeria excarinata*, Habu, *Bull. Nat. Inst. Agr. Sci. Ser. C*, No. **11**: 201-206.

1962: *Brachymeria excarinata*, Habu, *Fauna Japonica* p. 61-65.

*Female*: Length 3.0-4.5 mm. Black; tegulae clear yellow, basal part reddish brown. Coxae and trochanters black, more or less shiny; femora in all legs mostly black except yellow apex. Fore tibiae clear yellow, with or without blackish long patch at middle on outer and ventral sides; dorsal side entirely yellow; inner side somewhat brownish. Mid tibiae clear yellow, with or without a long black ring at middle. Hind tibiae (Fig. 8) mostly black; base sometimes slightly reddish, with yellow patch at sub-basal part, this patch sometimes rather small, sometimes rather large, usually reaching outer and inner ventro-lateral carinae, and with yellow rather long patch at apex, this patch not reaching ventro-lateral carina on outer side, though apex on outer side becoming brown, patch on inner side becoming brownish and attaining both ventro-lateral carina and apical margin. Pubescence and bristles on body silvery-white.



*Head* (Fig. 1) as wide as or slightly wider than thorax; surface weakly or faintly pitted on dorsal side, rather irregularly carinate on dorsal part of frons, faintly carinate on ventral part of frons and genae, smooth at middle of frons below scrobe; surface in scrobe polished; width of ocellar area three-fourths as wide as interocular space at level of hind ocelli; interocellar distance two and one-fourth to two and one-half times as wide as major axis of hind ocelli; frons with more or less distinct preorbital carinae, these carinae widely abbreviated



52: Figs. 1-8. — *Brachymeria excarinata* Gahan (♀)  
 1, head in front view; 2, mandibles; 3, head in lateral view;  
 4, antenna; 5, scutellum in lateral view; 6, scutellum in dorsal view,  
 7, forewing venation; 8, hind femur and tibia.

near the malar ridge; scrobe moderately deep, occupying one-half of width of interocular space, reaching front ocellus; inter-antennal projection narrow; area below scrobe relatively low, somewhat convex at middle, more or less depressed along fronto-clypeal suture; height of malar space three-sevenths as high as compound eye; genotemporal regions without postorbital carina; front genal angle rounded, hind angle outuse and rounded, ventral margin connecting front and hind angles (Fig. 3) more or less arcuate; right mandible (Fig. 2) with three pointed teeth. Antennae (Fig. 4) not stout; scape elongate, not exceeding front ocellus, as long as segments 4 to 7 combined, gently contracted at apical one-third; pedicel slightly longer than wide; segments 4 to 10 equal in length, slightly increasing in width; club twice as long as segment 10.

*Thorax* densely pitted on dorsal side, pits somewhat shallow, interspaces of pits weakly carinate, somewhat distinctly on scutellum, with distinct microsculpture. Scutellum one and one-seventh to one and one-fourth times as wide as long, rather gently declined posteriorly, apical part relatively narrowly explanate and reflexed, apical margin rounded (Figs. 5 & 6). Forewing two and three-sevenths to two and one-half times as long as wide; submarginal vein often interrupted before reaching marginal vein; marginal (Fig. 7) one-half or slightly more than one-half as long as submarginal; postmarginal one-third to two-fifths, as long as marginal, twice or a little more than twice as long as stigmal. Hind coxa with distinct dense punctures and dense pubescence and distinct microsculpture on ventral side, without protuberance on inner ventral side. Hind femur (Fig. 8) generally a little less than twice as long as wide; outer side densely pubescent, distinctly reticulate, with punctures very minute, often almost invisible; inner side somewhat less densely pubescent than on outer side, with rather distinct punctures, without distinct microsculpture, without protuberance at baso-ventral side; outer ventral margin with generally ten to twelve teeth.

*Abdomen* somewhat pointed posteriorly, a little longer than pronotum, mesoscutum and scutellum combined, widest at about middle, a little narrower than thorax. First tergite smooth. Second tergite finely and densely punctate at dorsal side, punctures sometimes turned into microsculpture; latero-dorsal areas and dorsal one-half or two-thirds of lateral sides punctate and bristled; lateral sides with distinct microsculpture. Sixth tergite very rough owing to rather shallow bristled pits and distinct microsculpture. Ovipositor sheath visible from above.

*Male* : 2.8 — 3.3 mm. Resembles the female in all respects except in its smaller size and antennae provided with trichoid sensillae on ventral side of funicle.

*Specimens examined* : Coll. Nos. C. U. 16 to 22, 199 and 341 from the collections of Dept. of Zoology, University of Calicut, Kerala. Coll. Nos. C. U. 298 to 310 from Commonwealth Institute of Biological Control, Bangalore. Coll. Nos. C. U. 390, 396, 398, 399, 401, 411, 424, 433, to 436, 440, 443, 447, 448, 454 to 457, 474 to 477, 514, 529, 555, 569, 580, 582 to 584, 587, 589, 590, 594, 595, 598, 600, 604, to 606, 608, 609, 615, 616, 620 to 622, 626, 631, 637, 638, 642, 644, 646, 652, 654, 657, 670, 673, 697 and 700 from the collections of Bishop Museum, Honolulu. Coll. No. C. U. 823 from Zoological Survey of India, Calcutta. Coll. Nos. C. U. 1592 to 1604 from Indian Agricultural Research Institute, New Delhi. Coll. Nos. C. U. 1926 to 1930 from Magyar Nemzeti Museum, Budapest.

*Distribution* : India, Thailand, Singapore, B. N. Borneo, Philippines, China, Vietnam, Taiwan, Laos, Formosa, Japan and Egypt.

*Hosts* : This species is parasitic on some Lepidoptera : *Cnaphalocrocis medinalis* Guenee (Pyralidae) in the Philippines (After Gahan, 1925; Masi, 1940b) ; Pruthi and Mani, 1940) ; Otanes and Sison, 1941) ; *Plutella maculipennis* Curtis (Yponomeutidae) in South India (after Cherian and Basheer, 1938; Pruthi and Mani, 1940); *Grapholitha molesta* Busck (Eucosmidae) in Japan (after Haeussler, 1940), *Compolechia metagramma* Meyrick (Gelechiidae and *Grapholitha molesta* Busck (Eucosmidae), and one example from an Acacia leaf roller, *Homona* sp. (Tortricidae) in Japan (after Habu 1960).

*Affinities* : *B. inermis* (Fonsc.) resembles *B. excarinata* Gahan in many features but differs from it mainly in having : (i) the scrobe slightly distant from front ocellus ; (ii) hind tibia in the base faintly reddish ; (iii) genae somewhat tumid below compound eyes.

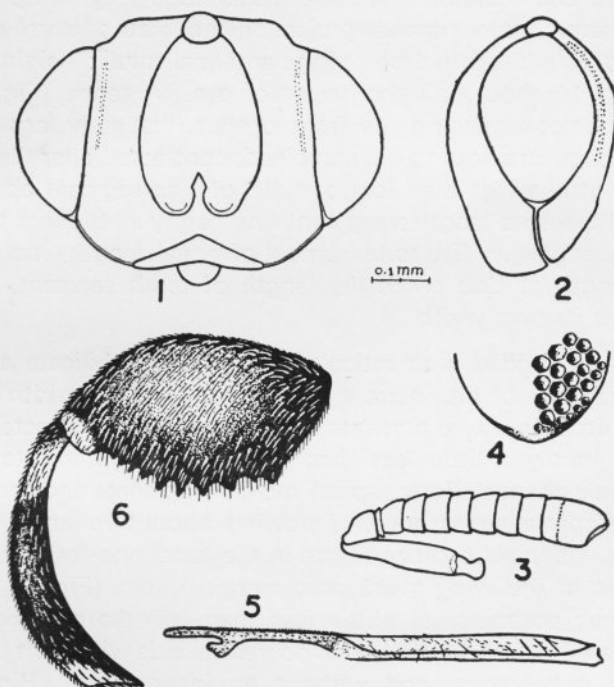
*Remarks* : The above account of *B. excarinata* Gahan is based on the description given by Habu (1960).

### 53. *Brachymeria excarinata plutellae* Joseph *et al* (53: Figs. 1 - 6)

1972 : *Brachymeria excarinata plutellae*, Joseph *et al*.  
*Tech. Bull. Commonw. Inst. biol. control.*, **15** :  
19-22.

*Male* : Length 1.39 mm. Black ; tegulae pale yellowish. Front, middle and hind coxae, trochanters and femora liver-brown except the

distal tips of femora where they are pale yellowish; front tibia yellowish with black colouration medially on outer, dorsal and ventral sides; inner sides pale brownish; middle tibiae liver-brown with yellowish colouration at the base and apex; hind tibiae liver-brown with yellowish colouration subbasally and apically. Pubescence sparse and dirty-white.



53: Figs. 1-6. — *Brachymeria excarinata plutellae* Joseph et al. (♂)

1, head in front view; 2, head in lateral view; 3, antennae;

4, scutellum in dorsal view; 5, forewing venation; 6, hind femur and tibia.

*Head* (Fig. 1) width distinctly less than the width of thorax, a little over one and one-third as wide as its own length; surface of head rugose, faintly pitted and somewhat rough; surface of scrobe almost rugulose; scrobe deep, its maximum width occupying a little over half the interocular space, attaining the front ocellus. Length of scrobe one and one-third its width; parascrobal space about one-third the width of scrobe. Length of eye (Fig. 1) about two and a half times its own width; median ocellus larger than lateral; the distance between median and lateral ocelli about three-fifths the interocellar distance; interocular space a little over two times the

interocellar distance; interocellar distance a little over five times the ocellocular distance. The width of clypeus about five times its median length. Width of labrum a little less than two times its median length. Width of ocellar area a little over three-fourths the interocular space; interocellar distance about three times the maximum diameter of the lateral ocellus. Frons with faint preorbital carina which becomes abbreviated and indistinct near the malar ridge (Fig. 1); postorbital carina absent. Inter-antennal projection moderate; lateral ridges of scrobe not produced in front of the antennal toruli; height of malar space (Fig. 1) about half the height of eye. Antenna (Fig. 3) very thin; scape not exceeding the front ocellus, distinctly less than the length of segments four to six combined, contracted after the middle, pedicel a little wider than long; width of ring segment about three and a half times its length; segment four hardly a little less than segment five; segments five to ten almost of equal length, increasing in width; length of club twice the length of tenth segment, one and three-fifths its own width.

*Thorax* provided with reticulate, rounded, umbilicate and close pits; interspaces of pits narrow and rugose (Fig. 4); width of mesoscutum a little over two times its length; notaulices distinct; width of scutellum hardly a little less than its length, high in lateral view, gently declined posteriorly, apical margin explanate and rounded off with very sparse pubescence. Forewing about two and two-thirds as long as wide; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane; marginal vein (Fig. 5) half the submarginal; postmarginal a little less than half the marginal, a little over twice the stigmal. Hind coxa on ventral side with faint punctures and close pubescence, and without an inner tooth. Hind femur (Fig. 6) about one and three-fourths as long as wide; outer side distinctly reticulate with minute, faint and indistinct punctures; ventral margin with a row of ten black teeth (Fig. 6); teeth 1 and 3-7 of almost equal size, 2 small, 8 and 9 smaller and 10 smallest; inner basal tooth lacking. Hind tibia longer than hind femur.

*Abdomen* length equal to that of pronotum, mesoscutum and scutellum combined, one and two-thirds its own height, highest in the middle. First tergite smooth and shiny. Second tergite finely and deeply shagreened. Sixth tergite with two or three transverse rows of faint punctures.

*Holotype* ♂. Coll. No. 313 on pin, its antenna and forewing on slide No. 313a and hind leg on slide No. 313b. *Allotype* ♀, length 1.43 mm. This specimen could not be described as the Holotype due to improper mounting. But all the characters which could be

noted are similar to those of the male. Coll. No. 311 on pin. INDIA: Mysore State, Coll. V. P. Rao. (No. 313 from Bangalore in May 1965 from the pupa of *Apanteles plutellae*; No. 311 from Bangalore in June 1965 from cocoon of *Apanteles plutellae*). Hence this species is a hyperparasite. Types deposited in British Museum (Natural History), London.

*Distribution* : India.

*Host* : *Apanteles plutellae* Kurdjumov (Fam: Braconidae).

*Remarks* : This subspecies can be distinguished from *Brachymeria excarinata* Gahan in the following characters: (i) considerably smaller size (in *Brachymeria excarinata* the length varies from 3.0 to 4.5 mm., whereas in this subspecies it is only about 1.4 mm.); (ii) a distinct preorbital carina is present in *Brachymeria excarinata*; (iii) head as wide or slightly wider than thorax in *B. excarinata* whereas in this subspecies width of head is distinctly less than that of thorax.

This subspecies comes very near to *B. apantelesi* Risbec\* in so far as we could gather from literature.

#### 54. *Brachymeria raoi* Joseph *et al.* (54: Figs. 1–6)

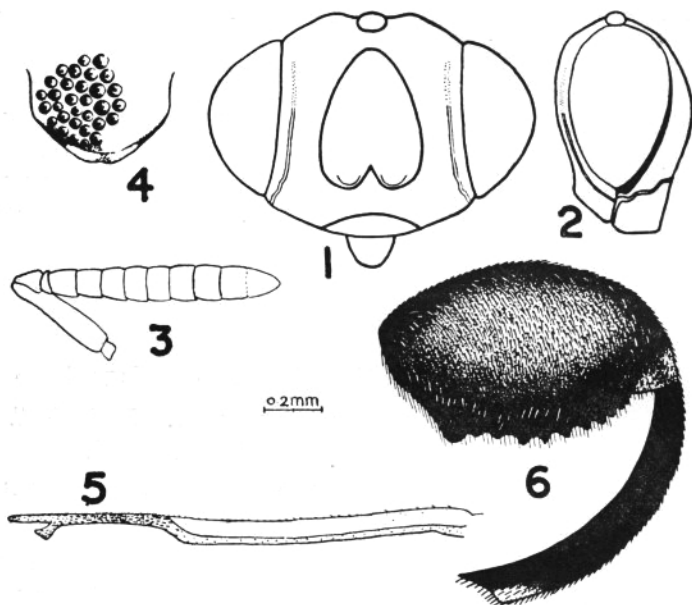
1972 : *Brachymeria raoi* Joseph *et al.*, *Tech. Bull. commonw. Inst. biol. control.*, **15**: 21–24.

*Female* : Length 4.18 mm. Black; tegulae pale yellowish-brown with blackish-brown basal margin. Fore coxa and trochanter brownish-black; femur brownish-black with a pale reddish-yellow tinge at the tip; tibia brownish-black except the tip which is reddish-brown. Mid coxa and trochanter brownish-black; femur brownish-black with a pale reddish-yellow tinge at the tip; tibia brownish-black except the tip which is reddish-brown with blackish tinge. Hind coxa and trochanter brownish-black; femur brownish-black except the tip where it is pale yellowish-brown; tibiae brownish-black except the tip which is yellowish-brown. Pubescence sparse.

*Head* (Fig. 1) hardly a little wider than the width of thorax, about one and one-fourth as wide as long; surface of the head rugose with reticulate, rounded and close pits. Surface of scrobe rugulose; scrobe deep, occupying a little over half the interocular space, not reaching the front ocellus. Facial area somewhat coarsely punctured. The area below scrobe at middle fairly smooth but not clearly demarcated. Length of scrobe about one and a half times its own width;

\* Risbec, J., 1956 — Hymenopteres du Cameroun, *Bull. Inst. Franc. Afr. noire*, **XVIII**, Ser A, No. 3: 807 – 809.

parascrobal space a little less than half the width of scrobe. Length of eye (Fig. 1) two and one-fourth its width. Size of median ocellus almost equal to that of the lateral; the distance between median and lateral ocelli about half the interocellar distance; interocular space a little over two and one-third interocellar distance. Width of clypeus about four times its length. Width of labrum a little more than one and a half times its median length. Width of ocellar area a little over three-fourths the interocular space; interocellar distance twice the



54: Figs. 1-6. — *Brachymeria raoi* Joseph *et al.* (♀)

1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, forewing venation; 6, hind femur and tibia.

maximum diameter of lateral ocellus. Frons with preorbital carina; postorbital carina present, running in a wavy manner and joining the genotemporal margin (Fig. 2). Inter-antennal projection moderately developed. Lateral ridges of scrobe not produced in front of the antennal toruli. Height of malar space a little over one-third that of the eye (Fig. 1). Front genal angle nearly rectangular and rounded; hind genal angle nearly rectangular. Antenna (Fig. 3) very thin; scape not exceeding the front ocellus, longer than the length of segments four to six combined, contracted after the middle; pedicel longer than wide; ring segment two and a half times as wide as long; segment four almost as wide as long; segments five, six, seven and



eight almost of equal length; sixth segment wider than fifth and almost as wide as the seventh, eighth, ninth and tenth segments and the club; ninth segment as long as tenth; length of club a little over twice that of the tenth segment and a little more than one and a half times its own width.

*Thorax* provided with reticulate, rounded, umbilicate and close pits (Fig. 4); interspaces of pits narrow and rugose. Mesoscutum one and three-fourths as wide as long; notaulices distinct. Scutellum hardly a little wider than long; moderately high in lateral view, gently declined posteriorly; apical margin explanate and weakly emarginate with sparse pubescence. Forewing about two and a half times as long as wide; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane; marginal vein (Fig. 5) a little less than half the submarginal; posrmarginal a little less than half the marginal and a little over twice the stigmal. Hind coxa on ventral side with close punctures and pubescence and without an inner tooth. Hind femur with close punctures and pubescence on outer side, about one and three-fourths as long as its width; ventral margin with a row of twelve black teeth as in figure (Fig. 6); teeth: 1 largest, 4-9 large, 2 and 3 small, 10-12 smallest; inner side without a tooth at base. Hind tibia a little longer than hind femur.

*Abdomen* length distinctly more than the length of pronotum, mesoscutum and scutellum combined; hardly a little more than twice its height; highest in the middle. First tergite smooth and shiny, extending to about half the length of the abdomen. Second tergite with microsculptures. Sixth tergite rugose, with very few punctures and sparse pubescence.

*Holotype* ♀, Coll. No. 247 on pin, antenna and forewing on slide No. 247a and hind leg on slide No. 247b. India: Mysore State, Bangalore, Coll. V. P. Rao in November, 1955. Types deposited in British Museum (Natural History), London.

*Specimens examined*: Coll. Nos. C. U. 369, 389, 421 & 575 from the collections of Bishop Museum, Honolulu.

*Distribution*: India, Vietnam & Hong Kong.

*Host*: Unknown.

*Affinities*: This species resembles *Brachymeria carbonaria* Zehntner in the following characters: (i) the punctures of the mesoscutum with narrow interspaces; (ii) hind leg colouration. But this species differs from *Brachymeria carbonaria* mainly in having the malar ridge branched below the compound eyes whereas in *B. carbonaria* the malar ridge is not branched below the compound eyes.



**Species Inadequately Described.**

The descriptions of the following ten species are short and are based on scanty descriptions available in literature. Some of the very old type specimens located in different museums in Europe and America are either in damaged condition or lost. In other cases the type specimens were not available for our study. As a result we could not confirm the identities of these species and had to be content with the short descriptions that are available and short taxonomic notes supplied by specialists working in these museums.

**55. *Brachymeria atridens* Waterston**

1922: *Chalcis atridens*, Waterston, *Ind. For. Rec.* **IX**, p. 56.

1925: *Chalcis atridens*, Ramakr., *Spol. Zeyl.* **XIII**, p. 239.

*Female*: Length 6 mm. Body and coxae black; scape narrowly at base and apex above (but not medially) dark brown; tegulae basally brown, apical two-thirds yellow. Fore femur upto two-thirds and mid femur upto three-fourths from base nearly black, thereafter brownish and yellow at the extreme tip. Hind femur ferrugineous with a darker spot externally towards the base. Fore tibia yellowish or yellowish-brown with a darker spot towards the middle externally; mid tibia blackish-brown, paler at base and more broadly at apex; hind tibia ferrugineous with the apical one-fourth to one-fifth yellowish-white and the ventral edge blackish. Pubescence generally whitish but yellowish at apex of abdomen.

*Head* like *B. minuta* L. type. Preorbital and postorbital carinae present. Preorbital carina slightly irregular. Area below scrobe entirely smooth. Frons slightly bulging but scrobal edge not high and obliterated before the front ocellus. Both mandibles bidentate, the teeth short and rounded.

*Thorax* with punctures close and interspaces between the pits narrow. Apex of scutellum broadly bilobate. No prominence or tooth dorsally behind the spiracle on propodeum. Alar expanse 12 mm. Hind coxa without an inner ventro-mesal tooth. Hind femur externally with strong punctures, the interspaces between the punctures not close; no basal tooth on inner side; outer ventral margin with a row of ten teeth, the first at about one-third from the base, followed by two smaller, the next five are subequal to the first; the first six teeth are widely spaced.

*Abdomen* with the first tergite smooth and shiny; second tergite with numerous punctures at the sides but reduced across the middle

to a single row, rest of the distal portion with microsculptures. Succeeding tergites smooth basally but with transverse rows of deep punctures apically. Coarse punctures on sixth tergite fairly dense, mesad in about six transverse rows.

*Holotype* ♀ preserved in British Museum (Natural History), London.

*Distribution* : India.

*Hosts* : Unknown.

*Affinities* : According to Waterston this species belongs to the *B. fonscolombei* Dufour section of the *B. minuta* L. group. *B. fonscolombei* Dufour differs from *B. atridens* Waterston in having: (i) an incipient tooth behind the spiracle; (ii) a well developed basal tooth on the inner side of hind femur; (iii) hind femur with a yellow apical spot; (iv) hind tibia black or brown or brownish-black with apical or subbasal yellow patches.

*Remarks* : The above account of *B. atridens* Waterston is based on the original description given by Waterston (1922) and on the short taxonomic notes supplied by Dr. Boucek (London).

#### 56. *Brachymeria alternipes* Walker

1871: *Chalcis alternipes*, Walker, *Notes on Chalcididae* p. 49.

*Male* : Length approximately 4.77 mm. Black, stout, with cinereous pubescence. Fore and mid femora red at base and tip, middle region black. Hind femur red. Fore and mid tibiae black with red colouration basally and apically. Hind tibia blackish with the base and apex red.

*Head* thickly and minutely punctured, as broad as the thorax. Antennae subclavate, a little shorter than the thorax.

*Thorax* thickly and minutely punctured. Prothorax subquadrate, its length equal to about one-sixth of its width. Notaulices well defined. Apex of scutellum emarginate with two minute apical teeth. Metathorax abruptly decumbent. Wings cinereous. Forewing with black veins. Marginal vein about half length of submarginal; postmarginal much shorter than the marginal; stigmal extremely short. Hind femora very thick with several very minute teeth beneath.

*Abdomen* oval, smooth, a little shorter than the thorax. First tergite large, shiny without punctures.

*Female* : Preorbital carina hardly indicated; postorbital carina distinct. Scrobal carinae slightly prominent except above. Punctures

on the thorax close and interspaces between the punctures narrow. Apex of scutellum laminate, produced, slightly emarginate in middle. Hind femur red, hind tibiae blackish but merging with red basally and (very narrowly so) apically.

*Types*: Preserved in British Museum (Natural History), London.

*Distribution*: South China and India.

*Affinities*: *B. bengalensis* Cam. comes near *B. alternipes* Walker in having the punctures on the thorax close, postorbital carina present, preorbital carina absent (hardly indicated in *B. alternipes*) and hind femora red. But it differs from *B. alternipes* in having the apex of scutellum distinctly bidentate, the apex of hind femur with a yellow patch and hind tibia yellow with the base black.

*Remarks*: The account of the male given above is based on the original description given by Walker (1871). The account of the female given above is based on short taxonomic notes supplied by Dr. Boucek.

#### 57. *Brachymeria apicornis* (Cameron)

1911: *Oncochalcis apicornis*, Cameron, *Soc. entom.* 26. p. 3.

*Female*: Length 4 mm. Black. The two apical joints of the antennae rufotestaceous; the tegulae bright lemon-yellow. Fore and mid tibiae yellow with a black line on either side of the tibia. Femora black except the apex which is yellow. Hind tibiae black with the basal third and the apical quarter (dorsally) pale yellow. Tarsi yellow. Legs and apex of abdomen thickly covered with silvery pubescence. The pubescence denser and longer on the underside of the hind femora.

*Head* with preorbital and postorbital carinae indistinct. Face in the centre smooth and shining and bearing some distinct striae; the sides opaque, coarsely aciculated and more or less striated. Lateral ridges of scrobe not produced in front of the antennal toruli. Front and vertex strongly, closely punctured.

*Thorax* with close rounded deep punctures with the interspaces between the punctures narrow and dull. Apex of scutellum broadly rounded off with distinct margin. Upper part of propleurae strongly aciculated, almost punctured, bordered below by a wide curved furrow, the apex by a narrower furrow; the base of mesopleurae smooth, shining; below with 2 oval, transverse foveae, under which are 2 rounded ones; below these, are elongated foveae with raised sides, the depressed apex shining, smooth except for some longitudinal

foveae; the base of metapleurae smooth, shining, the rest closely, coarsely reticulated. Hind coxa smooth, bare above, the rest closely punctured without an inner ventral tooth or protuberance. Hind femur with 10–11 teeth on the outer ventral margin.

*Types*: Types preserved in British Museum (Natural History), London.

*Distribution*: Java.

*Affinities*: *B. shansiensis* Habu seems to be allied with *B. apicornis* (Cameron) in the general colouration. But it differs from *B. apicornis* in having the frons with fine distinct preorbital carina.

*Remarks*: The above account of *Brachymeria apicornis* (Cameron) is based on the original description of Cameron (1911) and on short taxonomic notes supplied by Dr. Boucek.

### 58. *Brachymeria tarsalis* Motschulsky

1863: *Brachymeria tarsalis*, Motschulsky, *Bull. Soc. Imp. Nat. Museum* **XXXXVI**, (3), pp. 38, 39, 40.

1906: *Chalcis ashmeadi*, Schmied., *Spol. Hymen.* p. 150.

1909: *Chalcis tarsalis*, Schmied., *Gen. Ins.* **97**, p. 28.

1925: *Chalcis tarsalis*, Ramakr., *Spol. Zeyl.* **XIII**, p. 238.

*Female*? Length about 3.18 mm. Hind femur black, their apices light yellow; this yellow part occupies only one-eighth of the length of femur; hind tibia brownish-black with obscured brown base; distally from these brown bases is situated a yellow marking (patch), this patch occupies about one-seventh or one-fifth the length of the tibia; distal one-fourth of the hind tibia light yellow.

*Head* broader than pronotum and as broad as or a little less broad than mesonotum measured at the level of tegulae. The malar space in the middle with a thin longitudinal carina starting from the lower eye margin and reaching the lateral mouth margin.

*Thorax* densely punctured. Pronotum transverse and somewhat cylindrical. Mesonotum rather narrow and triangular with the apex of scutellum rounded off. Hind femur with a basal tooth on the inner side; the distance from this tooth to the base of femur and the distance from this tooth to the apex of the femur is in the ratio 3:7. Outer ventral margin of hind femur with a row of minute teeth.

*Abdomen* subconical. First tergite smooth and shiny. Second tergite reticulate with small pits. Abdomen hairy on the sides and on the posterior part.

*Type*: Preserved in Moscow State University Museum.

*Distribution*: Ceylon.

*Remarks*: The above account of *B. tarsalis* is based on the original description given by Motschulsky (1863) and on the short taxonomic notes supplied by V. Trjapitzin. *Chalcis ashmeadi* Schmied. is a synonym of *B. tarsalis*.

### 59. *Brachymeria jambolana* Gahan

1919: (1920) *Tumidicoxoides jambolana* (Girault), Ramakrishna Ayyar, T. V., *Proc. 3rd Ent. Meeting Pusa*, P. 323.

1925: *Tumidicoxoides* n. sp. (Girault), Ramakrishna Ayyar T. V., *Spol. Zeyl.* **13** (2): 254.

1942: *Brachymeria jambolana*, Gahan, A. B., *Proc. U. S. Nat. Mus.* **92**, No. 3137, P. 41.

*Female*: Length 4.27 mm. Black; flagellum dark brown or black; palpi, tegulae, apical half of anterior femur, apical one-third of median femur, a large spot at apex of hind femur, anterior and median tibiae entirely, and all tarsi yellow. Hind tibia yellow with a narrow black or blackish band at extreme base and the ventral carina black. Pubescence on body grayish-white and dense on the front of head.

*Head* with preorbital carinae absent; postorbital carinae present and well developed. Ocellocular distance approximately equal to the diameter of the lateral ocelli. Antennal segments (all except first) slightly broader than long.

*Thorax* provided with close punctures and interspaces narrow. Apex of scutellum weakly emarginate medially. Propodeum coarsely and irregularly rugose. Postmarginal vein fully twice as long as stigmal vein. Hind coxa without an inner ventromesal tooth. Hind femur with rather weak, fine punctures, more or less shining, its ventral margin with 10 to 12 blunt teeth, the 3 teeth nearest base usually shorter than the others.

*Abdomen* subacute and ovate. First tergite smooth, following segments weakly shagreened with one or more conspicuous rows of hairs, extending across the dorsum. Sixth tergite with strong pits, about 5 pits in a row in addition to the shagreening.

*Types*: Preserved in U. S. National Museum, Washington, U.S.A., Number 20898.

*Distribution*: India.

*Hosts:* Parasitic on: (i) *Carea subtilis* infesting *Eugenia jambolana*; (ii) on *Danaïd* sp.; (iii) on *Papilio agamemnon*.

*Affinities:* Very similar to *B. euploeeae* Westwood. If antennae are absent, it is extremely difficult to distinguish one species from the other. As the proportions of the antennal segments differ in these two species, this character of the antennae may serve to distinguish the species.

In the original description Gahan (loc. cit.) compares *B. lasus* Walker under the name *B. euploeeae* with *B. jambolana*. *B. jambolana* differs from *B. lasus* Walker mainly in having no ventromesal tooth on the hind coxa in female.

*Remarks:* The above account is based on the original description given by Gahan (loc. cit.) and short taxonomic notes supplied by Dr. Boucek in personal correspondence.

#### 60. *Brachymeria banksi* Ashmead

1905: *Chalcis banksi*, Ashmead, *Proc. U. S. Natl. Mus.* XXVIII, p. 964.

*Female and Male:* Length 2.6 — 2.8 mm. Black; tegulae and apices of femora yellow or white. Fore and mid tibiae yellow or white with a black spot on the middle inner side. Hind tibia yellow, dark at base and in the middle. All tarsi except the pulvilli white or yellow.

*Head* closely punctate. Preorbital carinae absent; postorbital carinae present. Lateral ridges of scrope not produced in front of the antennal toruli.

*Thorax* closely punctate, interspaces between the punctures narrow. Apex of scutellum emarginate. Wings hyaline; the veins black; the marginal vein nearly four times as long as the stigmal vein; the stigmal half the length of postmarginal. Hind coxa without an inner ventro-mesal tooth.

*Abdomen* with first tergite smooth and polished. Sixth tergite with four rows of closely spaced, separate pits.

*Type:* Preserved in U. S. National Museum, Washington, Cat. No. 8392.

*Distribution:* Manila (Philippines).

*Affinities:* *B. minamikawai* Habu seems to be nearer to *B. banksi* Ashmead in having the punctures on thorax close, pre-orbital carinae absent, postorbital carinae present and apex of

scutellum not emarginate. But *B. minamikawai* differs in having the scutellum somewhat prominently rounded at apex or hind tibia at basal area and area along ventral carina on outer and inner sides dark brownish, dorsal side dirty-yellow, more or less brownish except subbasal and apical areas.

*Remarks:* The above account of *B. banksi* is based on the original description by Ashmead (loc. cit.) and on short taxonomic notes supplied by Dr. Burks in personal correspondence.

#### 61. *Brachymeria carbonaria* Zehntner

1906: *Chalcis carbonaria*, Zehntner, *Handb. Sugarcult.*, p. 164.

*Female:* Predominantly dark species. Tegulae yellow. Hind femur with very narrow apical yellow spot. Hind tibia black from base to beyond the middle, the apical part yellow. Gaster tinged with tan at base.

*Head* with preorbital and postorbital carinae absent. Scrobe broader than the space between it and eye. Lateral ridges of scrobe not produced in front of the antennal toruli.

*Thorax* provided with close punctures; interspaces between the punctures narrow. Apex of scutellum not emarginate; propodeum short and declivous. Hind coxa without inner ventromesal tooth. Hind femur without inner basal tooth.

*Abdomen* with first tergite smooth. Sixth tergite nearly perpendicular, with about 7 rows of small, closely set pits, these tending to coalesce.

*Distribution:* Java.

*Remarks:* We could not get the original description given by Zehntner (1906) in spite of the efforts made by Dr. B. D. Burks to procure it. The above account is based on short taxonomic notes given in 1969 & 1971 by Dr. Burks from the specimens from Java present in the U. S. National Museum.

#### 62. *Brachymeria prodeniae* Ashmead

1904: *Chalcis prodeniae*, Ashmead, *Proc. U. S. Natl. Mus.*, XXVIII: 136.

*Male and Female:* This is a very small species for the genus *Brachymeria*. Male length 1.5 mm. Black, with whitish coloured eyes; the ocelli pale. Antennae black with brownish colouration at

apex. Hind femur black with the apex yellow; hind tibia pale yellow with black at base and in the middle.

*Head* closely and distinctly punctate, faintly pubescent. Pre-orbital and postorbital carinae absent. Lateral ridges of scrobe not produced in front of antennal toruli.

*Thorax* closely pitted, punctures relatively large; interspaces narrow. Apex of scutellum not emarginate.

*Abdomen* shiny, first tergite smooth. Sixth tergite densely clothed with bristles and so it is difficult to see pits, but apparently the pits form no pattern.

*Host* : Parasitic on *Prodenia* sp.

*Type* : Preserved in U. S. National Museum, Washington (Cat. No. 7912, U. S. National Museum) U. S. A.

*Distribution* : Philippines.

*Affinities* : *B. burksi* Chhotani seems to be related to *B. prodeniae* but differs in having somewhat larger size (4.25–4.40 mm.) and parasitic on *Aspidomorpha miliaris* F.

*Remarks* : The above account is based on the original description given by Ashmead (1904) and short taxonomic notes given by Dr. Burks.

### 63. *Brachymeria thracis* Crawford

1911: *Chalcis thracis*. Crawford, *Proc. U. S. Natl. Mus.* 41: 267–282.

*Female and Male* : Length 5 mm. (♂). Black; tegulae, bases and apices of fore and mid tibiae, spot at apex of hind femora, yellow. Hind tibia black with yellow patch subbasally and apically; tarsi yellow.

*Head* with preorbital carina present in male, absent or weak in female, postorbital carina present. Area below scrobe rugoso-punctate. Lateral ridges of scrobe not produced in front of the antennal toruli. Antennae swollen towards apex.

*Thorax* provided with umbilicate punctures; interspaces between the punctures mostly as wide as the punctures. Apex of scutellum not emarginate. Propodeum without lateral angular projections; wings glassy hyaline; hind coxa without an inner ventromesal tooth. Hind femur closely and minutely punctured on outer side; inner side finely punctured and without a tubercle on lower side near base.



*Abdomen* with first tergite smooth ; sixth tergite with very obscure pits in approximately 3 rows (in female) ; pits difficult to make out as they are concealed by long pubescence.

*Type* : Preserved in U. S. National Museum, Washington, U. S. A. (Cat. No. 13870 U. S. National Museum).

*Distribution* : Philippines.

*Remarks* : The above account is based on the original description of Crawford (1911) and on short taxonomic notes supplied by Dr. B. D. Burks.

#### 64. *Brachymeria javensis* Girault

1919: *Chalcis javensis*, Girault., *Treubia*, **1** : 53-59.

*Male and Female* : Small sized. Black. Antennae red. Trochanters and femora red except the apices of femora which are lemon-yellow. Fore and mid tibiae red with bases and apices lemon-yellow ; hind tibia lemon-yellow with the base black. Pubescence grey relatively dense on apex of scutellum, on cheeks, on metapleuron, on frons below antennae, on hind coxae and on venter of abdomen. Conspicuous golden pubescence present on abdominal tergites two to six.

*Head* with cephalic ocellus its own diameter from the scrobe. Antenna with the fourth segment a little longer than wide ; pedicel small and globular.

*Thorax* with the plate (apex) of scutellum entire. Hind coxae and femora punctulate. Posterior division of metapleuron cross striate, bounded behind by a row of punctures which cut off a narrow glabrous strip caudad ; first division only a narrow foveate stripe. Propodeum coarsely foveate. Forewing with the postmarginal over twice the stigmal.

*Abdomen* with thimble punctures on tergites three to six and with golden pubescence. Punctures sparse on the second tergite.

*Type* : Probably lost.

*Distribution* : Java.

*Remarks* : As per our request Dr. B. D. Burks tried to locate the types of *B. javensis* Girault without success. According to him the types of *B. javensis* Girault are probably lost.

#### 65. *Brachymeria ludlowae* Ashmead

1904: *Chalcis ludlowae*, Ashmead, *Journ. N. Y. Ent. Soc.* **12** : 13.

This species is represented by a male and a female cotypes which certainly are not the same species, most likely not the same genus. Both specimens are broken, the female lacking the head, the male being partly crushed so that its form is distorted. This information is given by Dr. B. D. Burks after examining the types present in the U. S. National Museum. Dr. Burks thinks the male specimen present there is *Trigonura*. The female may be a *Brachymeria* but without the head it is difficult to decide about it.

### Subgenus *Matsumurameria* Habu

- 1960: *Matsumurameria*, Habu, *Bull. Nat. Inst. Agr. Sci.*, Ser. C. No. **11**, pp. 209–213.  
 1960: *Matsumurameria*, (Habu), Burks, *Trans. Americ. Ent. Soc.* **LXXXVI**, p. 228.

*Subgenotype*: *Chalcis taiwanus* Matsumura

*Description*: Clypeus partly or completely fused with the face. Densely pubescent on post-clypeus. Hind coxa with a trichoid zone on inner ventral side. Punctures on the thorax distinctly wider than the diameter of the pits.

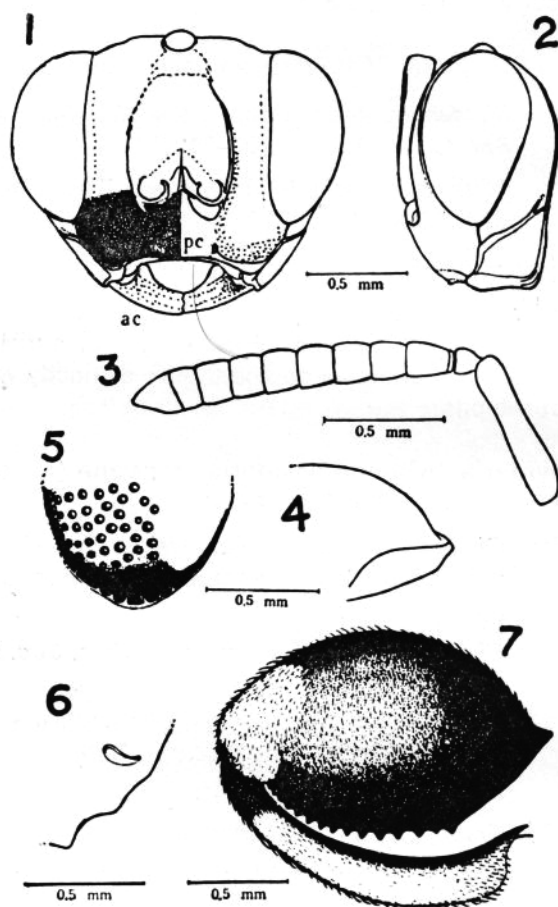
### 66. *Brachymeria* (*Matsumurameria*) *taiwana* (Matsumura)

(66: Figs. 1–7)

- 1910: *Chalcis taiwanus*, Matsumura, *Schadlichen und nutzlichen Insekten vom Zuckerrohr Formosas*: 26, 85, pl. 30, fig. 2.  
 1911: *Chalcis taiwanus*, Matsumura, *Mem. Soc. Ent. Belg.* **18**: 149.  
 1943: *Brachymeria euploeeae*, Sonan (= Matsumura) (nec. Westwood) (partim), *Rep. Gov. Formosa, Agr. Exp. Stat.* no. **84**: 79–83.  
 1960: *Brachymeria* (*Matsumurameria*) *taiwana* (Matsumura) Habu, *Bull. Nat. Inst. Agr. Sci.* Ser. C. No. **11**, p. 209–213.  
 1970: *Brachymeria clypealis*, Joseph et al., *Agri. Res. J. Kerala*, **8** (1): 25–28.  
 1971: *Brachymeria flagellata*, Joseph et al., *Oriental Ins.*, **5** (2): 234–236.

*Female*: Length 4.6 mm. Black, coxae black; shiny, apex somewhat brownish; fore and mid trochanters deep reddish-brown.

hind trochanters black, shiny; fore femora shiny black at more than basal half, yellow at remainder; mid femora shiny black, very faintly reddish, brown at base, yellow at apical part; hind femora (Fig. 7) black, shiny, with rather large yellow ring at apex; fore and mid tibiae yellow, slightly brownish at inner median part; hind tibiae (Fig. 7) yellow with the base black or brownish-black. Pubescence and bristles on body silvery-white.



66: Figs. 1-7. — *Brachymeria (Matsumurameria) taiwana* (Matsumura) (♀)

- 1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in lateral view; 5, scutellum in dorsal view;  
6, propodeum; 7, hind femur and tibia.

*Head* (Fig. 1) slightly wider than thorax; surface rather weakly pitted at dorsal side and at dorsal part of frons, faintly and irregularly

carinate between scrobe and compound eyes, faintly rugose at latero-ventral parts of frons, nearly impunctate and not rugose though rough owing to fine microsculpture at median area below scrobe, rather weakly punctate on genae, pubescence relatively denser at ventral part of frons, especially denser on median area below scrobe and on post-clypeus, but small smooth and glabrous areas present just below antennal sclerites; surface in scrobe smooth, without wrinkles; width of ocellar area slightly more than two-thirds as wide as interocular space at level of hind ocelli, interocellar distance two and one-fifth times as wide as major axis of hind ocelli; preorbital carinae vestigial; scrobe moderately deep, occupying less than three-fifths of interocular space, reaching front ocellus; inter-antennal projection strongly and finely carinate at middle; ventral part of frons including postclypeus almost flat, somewhat depressed at outer side of each anterior tentorial pit; malar spaces slightly more than one-third as high as compound eyes; postorbital carina distinctly carinate, reaching posterior margin of genotemporal regions, area above postorbital carina somewhat depressed; front genal angle protrudent though rounded; hind angle (Fig. 2) rather obtuse and fairly rounded. Antennae (Fig. 3) not stout; scape not exceeding front ocellus, almost as long as length of segments 4 to 7 combined, somewhat dilated before base; pedicel almost as long as wide; segment 4 a little longer than wide; segment 5 as long as wide, slightly wider but shorter than segment 4; segment 6 slightly wider but as long as segment 5; segment 7 to 10 almost as wide as segment 6, slightly decreasing in length; club twice as long as segment 10.

*Thorax* relatively weakly pitted on dorsal side; pits generally rather small; pits on posterior part of mesoscutum and on scutellum somewhat deep; pits faint on scapulae (especially near notaulices) and on axillae; spaces between pits somewhat carinate only on pronotum and on posterior part of mesoscutum, not carinate and relatively wide on other parts, fairly reticulate or striate on mesoscutum; mesoscutum one and one-sixth times as wide as long; notaulices rather distinct though narrow; scutellum (Figs. 4 & 5) rather low in lateral view, gently declined posteriorly; apical part weakly explanate, margin relatively thick, apex not emarginate but rounded. Propodeum (Fig. 6) strongly declined posteriorly, without tooth at lateral sides. Forewing two and one-half times as long as wide; marginal vein a little more than one-half as long as submarginal; postmarginal one-third as long as marginal, twice as long as stigmal. Hind coxae finely, densely punctate and pubescent at ventral side, especially very densely pubescent at inner ventral side, without

protuberance at inner ventral side; hind femur (Fig. 7) more than one and one-half times as long as wide, fairly convex, with minute dense punctures and dense pubescence, but without reticulation on outer side, with punctures and pubescence somewhat less dense on inner side; inner ventral side without protuberance near base; outer ventral margin with about fifteen teeth; teeth relatively small.

*Abdomen* as long as pronotum, mesoscutum and scutellum combined, widest slightly before middle, as wide as thorax. First tergite smooth. Second tergite rather densely punctate and bristled at latero-dorsal to dorso-lateral parts; other area on dorsal side almost smooth though with a few faint punctures on basal part; microsculpture very faint, but somewhat clear on punctured areas. Sixth tergite fairly rough owing to pubescent punctures and distinct microsculpture. Ovipositor sheath not visible from above.

*Lectotype*: 1♀, iv.29, 1907, Rinkihō, Formosa, preserved in the Collections of the Entomological Institute of Hokkaido University.

*Distribution*: India, Vietnam, Java and Formosa.

*Specimens examined*: Coll. Nos. C. U. 423, 430, 560 to 562, 567, 571, 573, 574 and 674 from the collections of Bishop Museum, Honolulu. Coll. No. C. U. 804 from Rijksmuseum van Natuurlijke Historie, Leiden. Coll. Nos. C. U. 1679 to 1686 from I. A. R. I., New Delhi. Coll. No. C. U. 1900 from Magyar Nemzeti Museum, Budapest.

*Affinities*: *B. (M.) criculae* (Kohl) differs from this species in having no preorbital and postorbital carinae, in having the hind femur red or blackish-red or infusate and the abdomen usually liver brownish-red.

*B. (M.) ryukyuensis* Habu differs from *B. (M.) taiwana* in having the hind tibia black with a whitish or dull whitish or yellowish colouration apically and subbasally and fronto-clypeal suture almost complete but not so distinct as in *B. (M.) taiwana*.

*B. clypealis* Joseph *et al.* and *B. flagellata* Joseph *et al.* are synonyms of *B. (M.) taiwana*.

*Remarks*: The above account of *B. (M.) taiwana* is based on the description given by Habu (1960).

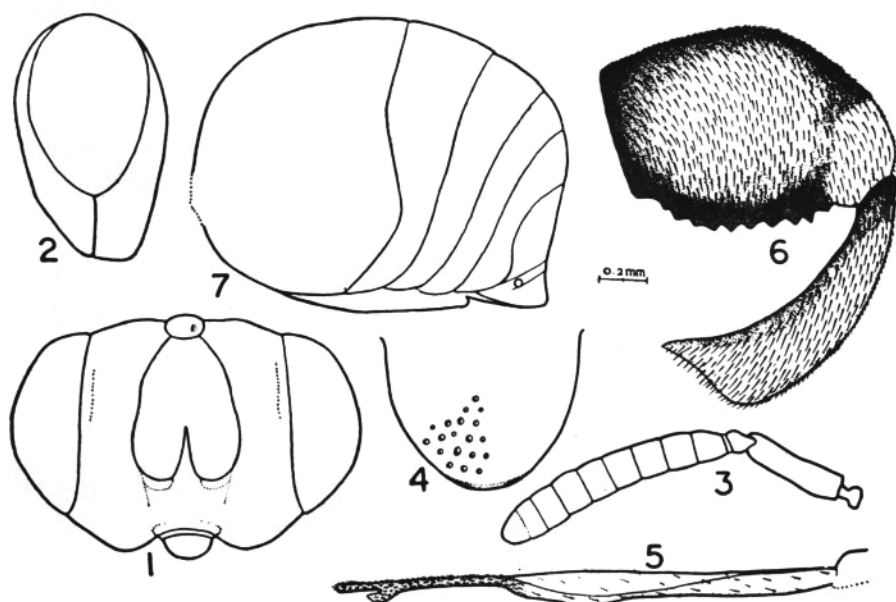
#### 67. *Brachymeria* (*Matsumurameria*) *criculae* (Kohl) (67: Figs. 1–7)

1889: *Chalcis criculae*, Kohl, *Ind. Mus. Notes*, 1, p. 80.

1904: *Chalcis argentifrons*, Ashmead, *Journ. N. Y. Ent. Soc.* **XII**, p. 136.

- 1909: *Chalcis criculae*, Schmied., *Gen. Ins.*, fas. **97**, p. 26.  
 1919: *Chalcis argentifrons*, Gahan, *Proc. U. S. Nat. Mus.* **LVI**, p. 518.  
 1925: *Chalcis criculae*, Ramkr., *Spol. Zeyl.*, **XIII**, p. 238.  
 1925: *Chalcis argentifrons*, Ramkr., *Spol. Zeyl.*, **XIII**, p. 239.  
 1927: *Chalcis argentifrons*, Ramkr., *Bull. Ent. Res.*, **XVIII**, p. 77.

*Female*: Length 3.58 mm. Head and thorax black, abdomen liver brownish-red; tegulae immaculate yellow. Coxae and trochanters reddish-brown. Front and mid femora reddish-brown except the distal regions which are immaculate yellow; tibiae and tarsi yellow. Hind femora orange-red with the distal tips yellowish; tibiae yellowish with the bases reddish which colouration extends to the distal region on the ventral margin with a slight extension in the middle region towards the dorsal region; tarsi yellow. Abdomen liver brownish-red; pubescence whitish and dense.



**67:** Figs. 1-7 — *Brachymeria (Matsumurameria) criculae* (Kohl) (♀)  
 1, head in front view; 2, head in lateral view; 3, antenna;  
 4, scutellum in dorsal view; 5, forewing venation;  
 6, hind femur and tibia; 7, abdomen in lateral view.

*Head* (Fig. 1) width a little less than that of thorax, a little more than one and one-third its length; surface of head with shallow pits; the interspaces of pits and inside of pits rugose. Scrobe deep, smooth and shiny, its maximum width a little less than three-fifths the interocular space, attaining the front ocellus; length of scrobe hardly a little more than one and one-third its maximum width; parascrobal space half the width of scrobe. Length of eye (Fig. 1) hardly a little more than two and three-fourths its width; median ocellus larger than lateral; the distance between median and lateral ocelli a little more than one-third the interocellar distance; interocular space a little more than two times the interocellar distance; interocellar distance a little less than four times the ocellocular distance. Post-clypeus delimited and indistinct, only smooth ante-clypeus visible. Width of labrum about twice its median length; width of ocellar area hardly a little more than three-fourths the interocular space; interocellar distance a little less than three times the maximum diameter of lateral ocellus. Frons without preorbital and postorbital carinae (Fig. 2). Area below scrobe not smooth but with coarse punctures; pubescence relatively dense at ventral part of frons, especially so on median area below scrobe and on post-clypeus, with small, smooth and glabrous area present just below antennal toruli. Lateral ridges of scrobe produced in front of antennal toruli (Fig. 1); inter-antennal projection long and thin; height of malar space (Fig. 1) about equal to that of eye; front genal angle almost rectangular; hind genal angle almost rectangular and rounded. Antennae (Fig. 3) not stout; scape not exceeding front ocellus, a little longer than segments four to six combined; somewhat dilated before base; pedicel almost as long as wide; ring-segment more than three times as wide as long; segment four a little wider than long; segment five subequal to segment four; segment six equal to segment five; segment seven hardly a little shorter than segment six and subequal to segment eight; thickness of flagellar segments gradually increasing from segments four to ten; club a little shorter than twice the tenth segment.

*Thorax* provided with small rounded pits. Pits on posterior part of mesoscutum and scutellum (Fig. 4) somewhat deep, faint on scapulae and on axillae. Spaces between pits somewhat narrow only on pronotum and on anterior part of mesoscutum, not carinate and relatively wide apart in other parts. Mesoscutum one and three-fourths as wide as long. Scutellum wider than long, rather low in lateral view, gently declined posteriorly; apical margin weakly explanate, apex not emarginate but rounded. Forewing a little less than two and a half times as long as wide; pubescence sparse in the basal one-fourth and



close in the rest of the wing membrane. Marginal vein about half the submarginal (Fig. 5); postmarginal about one-third the marginal, a little more than twice the stigmal. Hind coxa with punctures and pubescence on ventral side; dorsal side smooth and shiny without punctures and pubescence. Hind femur (Fig. 6) length about one and a half times its width; its outer side with minute punctures and pubescence; inner side with fewer punctures and pubescence and without a tooth; outer ventral margin with a row of 11 black teeth (Fig. 6).

*Abdomen* (Fig. 7) almost rounded, not pointed posteriorly, as long as pronotum, mesoscutum and scutellum combined. First tergite with fine microsculptures. Second tergite finely microsculptured, with a row of slightly larger punctures on the baso-dorsal and lateral areas. Sixth tergite rough with about six transverse rows of pits and moderately pubescent. Ovipositor sheath not visible from above.

*Specimens examined*: ♀ Coll. No. CU 1009 on pin, its antenna and forewing on slide Nos. 1009a and 1009b respectively, hind leg on slide No. 1009a, SOUTH INDIA: Coimbatore, Coll. unknown, on i. viii. 1914 from Lasiocampid pupa. Det. A. B. Gahan. Coll. No. C. U. 212 from Agricultural College, Bapatla. Coll. Nos. C. U. 649 and 664 from Bishop Museum, Honolulu. Coll. Nos. C. U. 1696 to 1702 from Forest Research Institute, Dehra Dun.

*Type*: ♀ No. 7696. Preserved in U. S. National Museum.

*Distribution*: India and Philippines.

*Hosts*: Lasiocampid pupa (Fam. Lasiocampidae), Wild silkworm *Cricula* sp. (Saturniidae).

*Affinities*: The species *B. criculae* (Kohl) is ascribed to the subgenus *Matsumurameria* Habu, on account of its having the following subgeneric characters: (i) Head without carinate fronto-clypeal suture, so post-clypeus not delimited, only smooth short ante-clypeus visible; (ii) Abdomen almost rounded, not pointed posteriorly. *B. (Matsumurameria) criculae* differs from *B. (Matsumurameria) taiwana* Matsumura in having: i) the first tergite of the abdomen with fine microsculptures; ii) no postorbital carina; iii) hind femora orange-red with the distal tips yellowish; iv) abdomen liver brownish-red. In consultation with Dr. Boucek we have come to the conclusion that *B. argentifrons* (Ashmead) is a synonym of *B. criculae* (Kohl) We have placed this species under the subgenus *Matsumurameria* Habu since it shows the characters of the subgenus mentioned above.

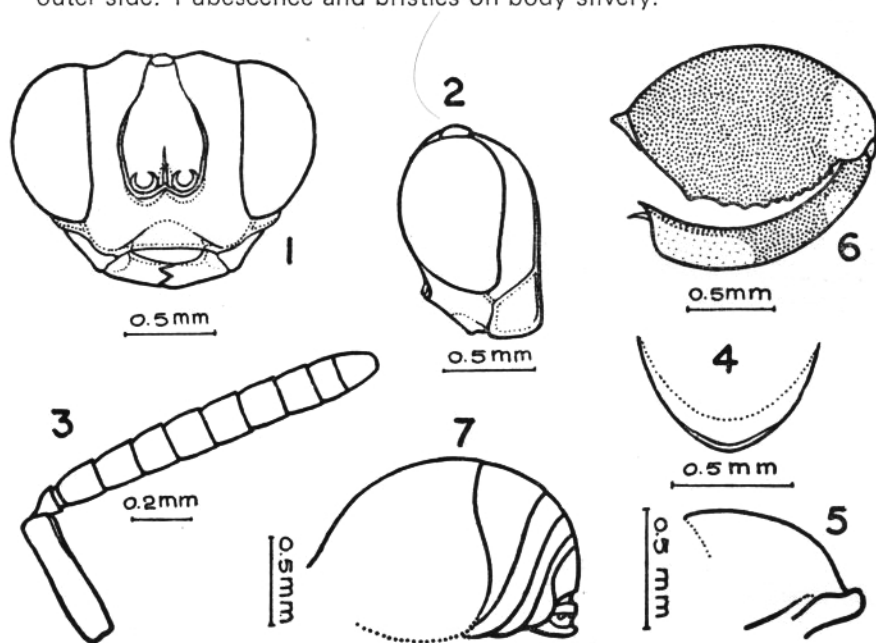


**68. *Brachymeria* (*Matsumurameria*) *ryukyuensis***

Habu (68: Figs. 1-7)

1966: *Brachymeria* (*Matsumurameria*) *ryukyuensis*, Habu, *Mushi* Vol. 37, Part 9, p. 115-117.

*Female*: Length 4.0 mm. Black; tegulae white, base dark brown. Coxae black; faintly reddish at apex in hind coxae; trochanters black; slightly reddish in hind trochanters; femora black, with whitish ring at apex; fore and mid tibiae whitish, with elongate reddish-black patch near middle; hind tibiae (Fig. 6) dark reddish-brown, with rather small whitish patch at subbasal area, and moderately large whitish patch at apical area, patches not reaching ventral carina on outer side. Pubescence and bristles on body silvery.



68: Figs. 1-7. — *Brachymeria* (*Matsumurameria*) *ryukyuensis* Habu (♀)

1, head in front view; 2, head in lateral view; 3, antenna;

4, scutellum in dorsal view; 5, scutellum in lateral view;

6, hind femur and tibia; 7, abdomen in lateral view.

*Head* (Fig. 1) a little wider than thorax; surface shallowly pitted on vertex and dorsal area of frons, irregularly, rather faintly carinate on ventral area of frons and genotemporal regions; pubescence of frons denser on ventral area than on dorsal area; post-clypeus not

punctate but shagreened, more densely pubescent than ventral area of frons; width of ocellar area more than two-thirds as wide as interocular space at level of hind ocelli; interocellar distance one and a half times as wide as major axis of hind ocelli; frons relatively narrow, without preorbital carinae; postorbital carinae present, reaching genotemporal margins; scrobe narrowed near front ocellus, reaching it; inter-antennal projection carinate at middle, thin anterior lamina short; clypeus somewhat risen and more visible than in *B. taiwana*; malar spaces less than one-third as high as compound eyes; frontogenal sutures well carinate except below compound eyes; front genal angle rather acute though rounded; hind angle (Fig. 2) somewhat obtuse. Antennae (Fig. 3) not well thickened; scape not exceeding front ocellus, a little longer than length of segments 4 to 6 combined; segment 4 a little longer than wide; segments 4 to 6 slightly increasing in width; segments 4 to 9 almost equal in length; segments 6 to 10 and club almost equal in width; club twice as long as segment 10.

*Thorax* densely pitted on pronotum, less densely on mesoscutum and scutellum; pits on scapulae faint at central area; interspaces of pits slightly wide on mesoscutum and scutellum, not carinate, fairly reticulate except on scutellum; scutellum (Figs. 4 & 5) moderately high in lateral view, apex slightly pointed though narrowly rounded (apex slightly notched in hind view), apical area moderately widely explanate-reflexed; propodeum without tooth on either side. Forewing two and two-thirds as long as wide; marginal vein more than one-half as long as submarginal; postmarginal less than one-third as long as marginal, twice as long as stigmal. Hind coxa with dense small pubescent punctures on ventral side, without protuberance on inner ventral side. Hind femur (Fig. 6) one and three-fourths as long as wide; outer side much swollen, with minute dense punctures and pubescence, neither reticulate nor striate; punctures and pubescence on inner side less dense than on outer side; inner ventral side without tubercle near base; outer ventral margin with about ten small teeth.

*Abdomen* (Fig. 7) as long as pronotum, mesoscutum and scutellum combined, widest at middle, perpendicularly declined posteriorly near apex. First tergite smooth. Dorsal side of second tergite with some punctures at basal and lateral areas, otherwise smooth, microsculpture very faint. Sixth tergite with compact pits, interspaces of pits finely carinate. Ovipositor sheath not punctate.

*Male*: Unknown.

*Holotype*: 1 ♀, x. 23, 1960, Yoshino — kabira, Ishigaki Is. Yaeyama group, K. Yasumatsu leg.

*Specimens examined*: 1♀ Coll. No. C. U. 449, Philippines; Coll. M. Thompson on 28.iv.1962 (From Bishop Museum, Honolulu).

*Distribution*: Japan (Ryukyu Is.) and Philippines.

*Host*: Unknown.

*Affinities*: *B. (M.) criculae* (Kohl) differs from this species in having no preorbital and postorbital carinae, in having the hind femur red or blackish-red or infuscate, the abdomen usually liver brownish-red and the hind tibia yellow with the base red.

*B. (M.) ryukyuensis* Habu differs from *B. (M.) taiwana* in having the hind tibia black with a whitish or dull whitish or yellowish colouration apically and subbasally and fronto-clypeal suture almost complete but not so distinct as in *B. (M.) taiwana*.

*Remarks*: The above account of *B. (M.) ryukyuensis* Habu is based on the description given by Habu (1966).

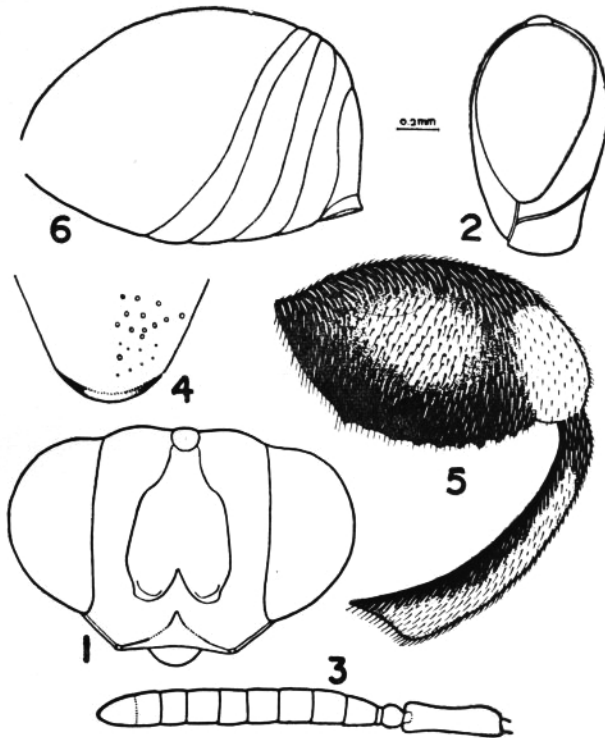
**69. *Brachymeria (Matsumurameria) nitida* Joseph *et al.***

(69: Figs. 1 – 6)

*Female*: Length 3.98 mm. Black; tegulae yellow with the basal margin slightly pale brownish. Coxae, trochanters and femora black except the distal ends of femora which are yellow. Fore and mid tibiae yellow with a brownish patch on the inner side in the middle. Hind tibiae yellow with the base black, this black colouration extending to the tip along the ventral region with a slight extension in the middle towards the dorsal region; tarsi pale brownish-yellow. Pubescence dirty-white and dense.

*Head* (Fig. 1) distinctly wider than thorax, about one and a half times its own length; vertex with very faint and shallow pits. Interspaces and inside of the pits rugose. Scrobe fairly deep, smooth and shiny; its maximum width a little over three-fifths the interocular space. Length of scrobe a little less than one and a half times its maximum width, reaching the front ocellus. Parascrobal space about one-third the maximum width of scrobe. Length of eye hardly a little over twice its width; size of median ocellus equal to that of lateral ocellus. The distance between median and lateral ocellus a trifle less than half the interocellar distance; interocular space a little over three times the interocellar distance; interocellar distance a little less than twice the ocellocular distance. Width of clypeus hardly a little over three times its median length; the dorsal margin of clypeus fused with the face on both sides as in the figure. Width of labrum a little less than three times its median length; width of ocellar area

a little over two-thirds interocular space; interocellar distance one and two-fifths the maximum diameter of the lateral ocellus. Frons without preorbital carina; postorbital carina present, reaching the



69: Figs. 1-6. — *Brachymeria (Matsumurameria) nitida* Joseph et al. (♀)

1, head in front view; 2, head in lateral view;

3, antenna; 4, scutellum in dorsal view;

5, hind femur and tibia; 6, abdomen in lateral view.

genotemporal margin (Fig. 2). Inter-antennal projection moderately developed. Lateral ridges of scrobe not produced in front of the antennal toruli. Area below scrobe without a median smooth raised portion. Height of malar space a little less than one-third the height of eye (Fig. 1). Front genal angle nearly rectangular (Fig. 2); hind genal angle nearly rectangular and rounded (Fig. 2). Antenna (Fig. 3) fairly stout; scape not exceeding the front ocellus, subequal to the length of segments four to six combined. Pedicel a little longer than wide; ring segment hardly a little over three times as wide as long; segments four to seven slightly increasing in width; segment eight

to club almost equal in width; club length two and a half times tenth segment length.

*Thorax* with extremely small rounded pits (Fig. 4) provided with setae. Interspaces between the pits very smooth, shiny and distinctly greater than the diameter of the pits (Fig. 4) on the scutellum, scapulae and on the posterior two-thirds of mesoscutum. The interspaces between pits on the pronotum and on the anterior one-third of the mesoscutum are closer and shagreened. Mesoscutum a little over two times as wide as long; scutellum length almost equal to its width, low in lateral view, gently declined posteriorly, its apical margin slightly explanate and rounded off with moderate pubescence. Dorsal margin of the lateral face of pronotum slightly interrupted anteriorly. Forewing a little over two and three-fifths as long as wide; marginal vein hardly a little over three-fifths the submarginal; postmarginal a little over one-fourth the marginal and equal to twice the stigmal. Hind coxa on ventral side shallowly pitted, rugose and pubescent without tooth or protuberance; dorsal side smooth and shiny. Hind femur (Fig. 5) a little over one and three-fourths as long as wide; outer side with small pits and interspaces between the pits smooth and shiny; outer ventral margin with a row of ten or eleven teeth; inner side with fewer punctures and pubescence, without a tooth or protuberance.

*Abdomen* (Fig. 6) length equal to that of pronotum, mesoscutum and scutellum combined, highest beyond the middle, one and a half times as long as its height. First tergite smooth and shiny. Second tergite with punctures and pubescence on sides and latero-dorsal parts; remaining area on dorsal side smooth with a few faint punctures basally. Sixth tergite with about six transverse rows of punctures, each row with several pits; interspaces between the punctures rugose. Ovipositor sheath not visible from dorsal side.

*Holotype* 1 ♀, coll. No. C. U. 534 on pin, its antenna and hind wing on slide No. 534a and hind leg on slide No. 534b respectively. B. NORTH BORNEO, 19 Km. north of Kalabakan Forest Camp., Coll. K. J. Kuncheria, (Bishop Museum Honolulu-Collection) on 14. xi. 1962.

*Type* : Deposited in Bishop Museum, Honolulu.

*Distribution* : North Borneo.

*Hosts* : Unknown.

*Affinities* : This species seems to be related to *Brachymeria* (*Matsumurameria*) *taiwana* Habu in having : (i) similar colouration;

(ii) punctures on the thorax widely separated; (iii) apex of scutellum rounded off; (iv) preorbital carina absent and postorbital carina present. But *B. (Matsumurameria) taiwana* differs from this species in having: (i) the dorsal margin of the clypeus completely fused with the face (whereas in *B. (M.) nitida* only the sides of the dorsal margin of the clypeus are fused with the face as in fig.); (ii) the pits on the thorax not as small as those of the thorax of *B. (M.) nitida*; the interspaces between the pits not as widely separated as the interspaces between pits on the thorax of *B. (M.) nitida*; (iv) presence of small smooth glabrous areas just below antennal sclerites in *B. (Matsumurameria) taiwana* (whereas in *B. (M.) nitida* no such areas present); (v) scape of female as long as the segments four to seven combined (whereas in *B. (M.) nitida* scape is distinctly shorter than segments four to seven combined); (vi) abdomen of female widest slightly before middle (whereas in *B. (M.) nitida* the abdomen is widest beyond middle).

*Remarks*: We have first described this species under the subgenus *Brachymeria*. But now we place it under the subgenus *Matsumurameria* since the dorsal margin of the clypeus is fused with the frons on the sides and the pits on the thorax are widely separated.

#### **Subgenus Neobrachymeria Masi**

- 1929: *Neobrachymeria*, Masi., *Ann. Mus. Stor. Nat. Genova*, **53**: 196-198.  
1960: *Neobrachymeria* (Masi), Habu *Kontyu*, **34** (1): 23-28.  
1960: *Neobrachymeria* (Masi), Burks, *Trans. Amer. Ent. Soc.*, **LXXXVI**, 229.

Type-species: *Brachymeria (Neobrachymeria) confalonierii* Masi from Giarabus (Cyrenaica), Libya (Monotypic and Original Designation).

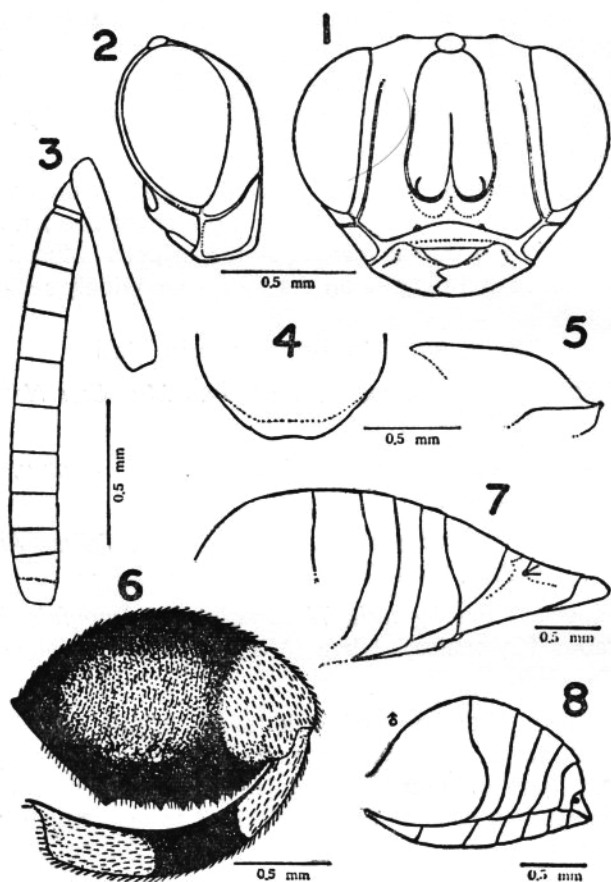
*Description*: Abdomen well prolonged in female, usually strongly acuminate at apex. First tergite proportionately short; epipygium fairly long; ovipositor sheath well projecting. In the male the length of the abdomen is normal and hence difficult to distinguish from genuine *Brachymeria*.

#### **70. Brachymeria (Neobrachymeria) nosatoi Habu** (70: Figs. 1-8)

- 1966: *B. (Neobrachymeria) nosatoi* (Masi), Habu, *Kontyu* **34** (1): 23-28.

1960: *B. (Neobrachymeria) nosatoi* (Masi), Burks, *Trans. Amer. Ent. Soc.* **LXXXVI**, 229.

*Female*: Legth 5.3–6.0 mm. Black, mat; tegulae pale yellow, basal part narrowly black. Coxae black; trochanters black; fore femora black at basal half, yellow at apical half; mid femora black, yellow at apical area; hind femora (Fig. 6) black, with relatively large yellow patch occupying apical one-third; fore and mid tibiae yellow at basal area and apical half, black at remaining part; hind tibiae (Fig. 6) yellow at basal one-third and apical one-third, black at median one-third; tarsi yellowish-white, faintly brownish. Pubescence and bristles on body silvery.



70: Figs. 1–6. — *Brachymeria (Neobrachymeria) nosatoi* Habu (♀)

1, head in front view; 2, head in lateral view; 3, antenna;  
4, scutellum in dorsal view; 5, scutellum in lateral view; 6, hind femur and tibia;  
7, abdomen in lateral view (♀); 8, abdomen in lateral view (♂).

*Head* (Fig. 1) slightly wider than thorax; surface with shallow pits, pits indistinct at ventral half of frons and genotemporal regions. Area below scrobe smooth and glabrous; pubescence on ventral half of frons and ventral half of genotemporal regions fully dense; width of ocellar area a little more than three-fourths as wide as interocular space at level of hind ocelli; interocellar distance twice to two and one-half times as wide as major axis of hind ocelli; preorbital carinae present; scrobe occupying one-half of width of interocular space, reaching front ocellus; inter-antennal projection moderately narrow, with moderately long thin anterior lamina; space between scrobe and clypeus relatively low. Height of malar space one-third as high as compound eye; genotemporal regions moderately wide; postorbital carina distinct, reaching hind margin of genotemporal regions; front genal angle somewhat protrudent-rounded, hind genal angle rather obtuse, rounded. Antenne (Fig. 3) not strongly stout; scape fully reaching front ocellus, a little longer than segment 4, a little longer than wide, slightly longer but as wide as segment 5; segment 7 as long as wide, slightly shorter and wider than segment 5; segment 10 one and one-third times as wide as long; club twice as long as segment 10.

*Thorax* compactly pitted on dorsal side, pits on scapulae shallow, interspaces of pits narrow, rather carinate except on scapulae, microsculpture rather distinct (less distinct on scutellum). Scutellum (Figs. 4 & 5) rather low in profile, gently declined apically, bristles not fully dense near apex, apical area explanate and reflexed, forming two faint lobes. Forewing two and two-thirds as long as wide; marginal vein a little less than one half as long as submarginal; postmarginal one-third as long as marginal, twice as long as stigmal. Hind coxa densely punctate and pubescent on ventral side, without protuberance nor trichoid zone at inner ventral side. Hind femur (Fig. 6) one and two-thirds as long as wide; outer side densely finely punctate, faintly striate, so somewhat mat, densely pubescent; inner side more finely, but less densely punctate, shiny, without protuberance near base; outer ventral margin with eleven to thirteen teeth, teeth rather small.

*Abdomen* (Fig. 7) one and one-half times as long as the length of pronotum, mesoscutum and scutellum combined, widest at or behind basal one-fourth. Posterior area of first tergite, and second tergite flat at dorsal side; posterior half gently sloping towards apex; first tergite smooth, covering one-fourth of gaster in dorsal view. Second tergite very finely and faintly punctate or faintly shagreened on dorsal side (in some cases smooth at median area), with some small



setiferous punctures on basal, latero-dorsal and dorso-lateral areas. Sixth tergite indistinctly rather sparsely punctate, well shagreened.

*Male* : Length 3.5–4.3 mm. In antennae, scape a little shorter than in female, barely reaching front ocellus, a little shorter than segments 4 to 7 combined; funicle without trichoid sensillae on ventral side. Scutellum not bilobed but almost straight at apex. Abdomen (Fig. 8) a little shorter than pronotum, mesoscutum and scutellum combined.

*Distribution* : India, Laos, Japan, and Philippines.

*Hosts* : *Nephantis serinopa* M., *Dioryctria splendidella* H.-S., *Evetria cristata* W.

*Holotype* 1 ♀, II. 5, 1965, Banna, Ishigaki Is. (reared by K. Nosato), preserved in the Entomological Laboratory, Kyushu University. *Paratypes* 1 ♀, 1 ♂, I. 19, 1965, Banna, Ishigaki Is. (reared by K. Nosato); 1 ♂, xi. 23, 1960, Yoshino-Kabira, Ishigaki Is. (K. Yasumatsu leg.); 1 ♂, xi. 26, 1960, Karimata, Miyako Is. (K. Yasumatsu leg.) (After Habu 1966).

*Specimens examined* : Coll. Nos. CU. 592, 597, 633, 658 from Bishop Museum, Honolulu. Coll. Nos. 976 to 982 from Central Plantation Crops Research Institute, Kayamkulam. Coll. Nos. 1182 to 1184 from Tamilnadu Agricultural University, Coimbatore. Coll. Nos. 1714 to 1716 from Forest Research Institute, Dehra Dun. Coll. Nos. 1464 to 1471 from I. A. R. I., New Delhi, and a few specimens collected from Kerala.

*Affinities* : *B. (N.) inornata* Masi differs from this species in having the colouration of legs mostly black whereas in *B. (N.) nosatoi* the legs are provided with wider yellow portions.

*Remarks* : The above account of *B. (Neobrachymeria) nosatoi* Habu is based on the description given by Habu (1966).

## 71. *Brachymeria (Neobrachymeria) ghani* \*

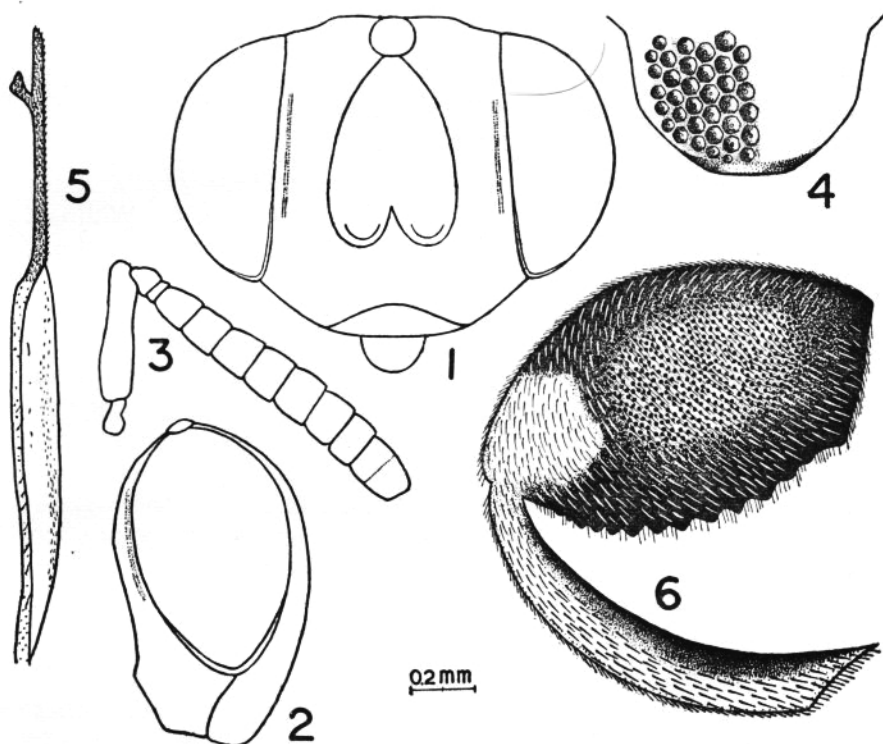
sp. nov. (71 : Figs. 1–6)

*Female* : Length 4.2 mm. Black; tegulae yellowish. Fore coxa and trochanter black; femur blackish-brown with the distal one-third yellow; tibia yellow; tarsi pale yellowish with the distal end brownish-black. Mid coxa and trochanter black; femur blackish-brown with the distal one-fourth yellow; tibia yellow; tarsus pale yellowish with distal end brownish-black. Hind coxa and trochanter black; femur black

\* So named after Professor M. M. Ghani, the first Vice-Chancellor of the University of Calicut, who has been a source of encouragement for our work.

except the distal tip which is yellow; tibia yellow except the ventral carina which is black; tarsi pale yellowish with distal end brownish-black. Pubescence on head and body dirty-white.

*Head* (Fig. 1) a little wider than thorax, one and one-fourth times as wide as its own length. Surface of the head with shallow and rounded pits with the interspaces of the pits rugose. Surface of the scrobe smooth and shiny; length of scrobe a little more than one and half times its width; the maximum width of scrobe a little more than half the interocular space. Parascrobal space half the width of scrobe. Area below scrobe faintly and uniformly pitted without a distinct smooth or triangular portion; scrobe attaining the front ocellus.



71: Figs. 1-6. — *Brachymeria* (*Neobrachymeria*) *ghani* sp. nov.

1, head in front view; 2, head in lateral view; 3, antenna;

4, scutellum in dorsal view; 5, forewing venation; 6, hind femur and tibia.

Length of eye (Fig. 1) a little more than two and one-third times its width. Median ocellus larger than lateral; the distance between lateral and median ocelli two-fifths the interocellar distance; interocular space two and one-fifth the interocellar distance. Width of clypeus slightly

more than four times its own length. Width of labrum two times its length. Width of ocellar area four-fifths the interocular space. Inter-ocular distance two and a half times the maximum diameter of the lateral ocellus. Frons with very faint preorbital carina (Fig. 1). Post-orbital carina absent (Fig. 2). Inter-antennal projection moderately developed. Lateral ridges of scrobe not produced in front of the antennal toruli. Height of malar space one-third the height of eye. Front genal angle acute; hind genal angle obtuse and rounded off. Antenna fairly stout (Fig. 3); scape not exceeding the front ocellus, longer than the length of segments four to six combined, contracted after the middle. Pedicel almost as wide as long; ring segment two and half times as wide as long; fourth, fifth, sixth, eighth and ninth segments of equal length and longer than segment seven and ten; tenth segment the shortest; segment four and five of equal width; segment six wider than segment four and five; segments seven to eleven of equal width and all wider than segment six; club length about twice that of segment ten and one and one-fifth times its own width.

*Thorax* provided with reticulate and umbilicate pits with the interspaces of the pits fairly rugose and narrow (Fig. 4). Width of mesoscutum about one and three-fourths its length; notaulices distinct; scutellum wider than long, moderately high in lateral view and gently declined posteriorly, apical margin explanate and entire with pubescence. Forewing a little more than two and half times as long as wide; pubescence sparse in the basal one-fourth and close in the rest of the wing membrane; marginal vein a little less than half the submarginal; postmarginal (Fig. 5) a little more than one-third the marginal and about thrice as long as the stigmal. Hind coxa and femur on outer side with close punctures, pubescence, and without inner tooth. Hind femur about one and three-fourths as long as wide; inner side without a tooth at base; ventral margin with a row of fourteen black teeth (Fig. 6). Teeth 2, 3, 13 and 14 small and others large and almost of equal size. Hind tibia a little longer than hind femur.

*Abdomen* length a little more than one and a half times the length of pronotum, mesoscutum and scutellum combined, highest before the middle, about two and three-fifths as long as its own height. First and second tergites shagreened. Sixth tergite with 8 to 9 transverse rows of shallow pits.

*Holotype*: 1 ♀, Coll. No. C. U. 246 on pin, antenna and forewing on slide No. 246a and hind leg on slide No. 246b. INDIA: Madras State, Madurai, Madurai Agricultural College Farm, Coll. P. J. Joy & K. Sreenivasan on 17. xii. 1969. *Paratypes*: 2 ♀♀, Coll. No. C. U. 528 on pin; NORTH BORNEO, Coll. L. W. Quate on 28-30. ix.

1958 ; Coll. No. C. U. 406 on pin; PHILIPPINES: Albay Province, Coll. H. M. Torrevillas on 17. v. 1965. The Holotype type deposited in the U. S. National Museum, Washington and paratypes are in the collections of Bishop Museum, Honolulu.

*Distribution* : India, North Borneo and Philippines.

*Host* : Unknown.

*Affinities* : *Brachymeria* (*Neobrachymeria*) *nosatoi* Habu differs from this new species in having postorbital carinae and the hind tibia with a median blackish band. *B. (N.) inornata* Masi differs from this new species in having the colouration of legs mostly black and hind femora completely black. *B. (N.) confalonierii* Masi differs from *B. (N.) ghani* sp. nov. in having the hind femur with half the distal portion yellow and the rest of the proximal distal portion black. *B. (N.) eublemae* Stef. differs from this new species in having the postorbital carina present and the first abdominal tergite without punctures,

#### ADDENDUM

Boucek (1972) synonymized *B. (Chalcis) alpius* Walker, *B. (Chalcis) xerxena* Walker, *B. (Chalcis) mansueta* Walker, *B. (Chalcis) eccentrica* Cameron, *B. (Chalcis) borneanus* Cameron, *B. (Chalcis) garutianus* Gunther, and *B. fonscolombeii* Dufour with *B. podagrica* (Fabricius). Since this information was given to us by Boucek only after the printing of the Monograph had reached its last few pages, we were forced to include the above species (except *B. (Chalcis) mansueta* Walker, *B. eccentrica* Cam., *B. alpius* Walk. and *B. garutianus* G.) in our key to the Oriental Species of *Brachymeria*. For the same reason the descriptions of *B. fonscolombeii* Dufour and *B. podagrica* (Fabricius) were separately included.

It may here be pointed out that *B. podagrica* (Fabricius) is a very variable species because forms with close punctures on the thorax (especially on the mesoscutum and scutellum) and others in which those punctures are wider apart, have been met with. Therefore the nature of distribution of the punctures (either close or wide apart) is not a characteristic feature of this species.

As the forms *B. (Chalcis) pandens* Walker, *B. (Chalcis) dividens* Walker, *B. (Chalcis) elongatula* Matschulsky, *B. (Chalcis) providens* Motsch. and *B. (Chalcis) marginata* Cameron of earlier authors have not been found to belong to the genus *Brachymeria*, these have not been included in our Key to the Oriental species of *Brachymeria* and their descriptions do not find place in this Monograph.

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